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OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 210 Number 25 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $8.52 | JUNE 21, 1934 | Published Weekly in Boston at 8 The Fenway

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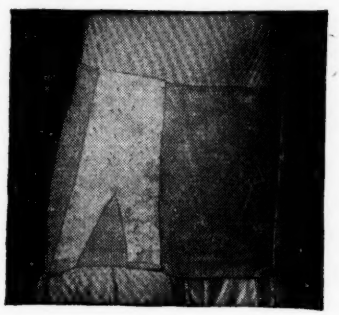

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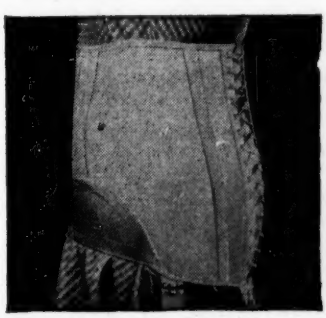

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The next Annual Meeting of the Massachusetts Medical Society will be held in Boston.

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The New England
Journal of Medicine

VOLUME 210 JUNE 21, 1934 NUMBER 25

ARTIFICIAL MENSTRUATION*

Effect of Female Sex Hormones In Amenorrhea

BY JOHN ROCK, M.D.†

THE cyclic changes occurring in the endometrium of the normal mature human female have been described with gratifying agreement by many investigators and the temporal correlation of these changes with those occurring in the follicular apparatus of the ovary convincingly demonstrated. (Schröder, Novak, Bartelmez, O'Leary.) The actual causal relationship of similar changes in the endometrium and ovaries of various other lower mammals as well as the relationship of changes, almost identical with those of the human being, in the endometrium and ovaries of monkeys has been equally well demonstrated by several biologists. (Allen, Hartman, Corner, etc.) These men have gone even farther and have shown that certain of the various changes occurring in the endometrium of laboratory mammals are actually the effects of the specific hormones, first of the developing follicle, folliculin, or estrin or theelin, and secondly of the corpus luteum, corporin, or progestin. It was fair to assume then, that the same correlated changes in the human ovary and endometrium were cause and effect phenomena attributable to the same hormones. Incontrovertible demonstration of this causal relationship in human beings has been impossible for obvious reasons, but a few clinical reports suffice to justify the assumption.

Let us first review the correlated changes occurring in the endometrium and ovaries, and later consider the evidence of a causal relationship between them.

Immediately after the menstrual flow has begun and while it ensues (Bartelmez) regeneration of the defects made in the mucosa by separation of fragments is rapidly carried on, probably to a large extent by the embryonic histiocytes of the stroma (Papanicolaou, Bain) and also by the glandular epithelium (Schröder, Novak, O'Leary) so that almost as soon as menstruation is over the uterine cavity is lined by a thin mucosa about 2 mm. in diameter, consisting of simple straight glands and dense lightly vascularized stroma. The epithelial cells lining the cavity of the uterus as well as that of the glands are barely columnar, the nucleus is near the middle and the volume of the nucleus is to that of the cell as 1:2.2. (O'Leary.) The stroma cells are closely packed, the nuclei small, and the cytoplasm almost too slight to be seen, except in the occasional connective tissue cell. Wandering cells are few. At this stage the corpus luteum of the preceding ovulation is rapidly regressing and the new follicles are beginning to grow. Comparatively small amounts of folliculin are thus available.

As the dominant follicle acquires supremacy and grows rapidly during the next several days, larger amounts of folliculin are elaborated. After the first week mitotic figures are frequent in glandular epithelium. This, then, is the proliferative phase. The cells of the surface and glandular epithelium become higher. By the eleventh day the nuclei have approached the base of the cells and have increased in size with the cytoplasm, and the ratio of nuclear to the cytoplasmic mass is roughly as 1:2.9, which is much the same as at the beginning of this phase. The nucleus comprises 34 per cent of the cell volume although the cells are taller and narrower. The glands, because of the proliferation, are necessarily longer and are less straight. The stroma is less dense but there is no great change in the stroma cells at first. As the amount of folliculin is increased by the growing follicle, which during this phase ruptures with ovulation and continues on to form the corpus luteum, the proliferation of the existing glands progresses, new ones grow upward from those of the basal layer and some of the older ones sprout branches. (O'Leary.) The glands are thus more numerous and close together. The stroma becomes even less dense, possibly with edema, certainly with some kind of fluid. Its vascularity increases, or at least its vessels are more noticeable, and its cells swell, so that not only are the nuclei larger but in most cells the cytoplasm as well has increased to easily discernible proportions. The cytoplasm of the epithelial cells has almost doubled in volume, so the nucleus, increasing less, only takes up 27 per cent of the cell volume, a ratio of 1:3.6. The wandering cells increase in number, and toward the end of this phase include among them many free red corpuscles singly and in groups of varying size. Necessarily the thickness of the mucosa has increased, roughly another centimeter by the end of the third week. (Bain.)

*From the Free Hospital for Women, Brookline, Mass. May 11, 1934.

†Rock, John — Surgeon to Out-Patients, Free Hospital for Women, Brookline. For record and address of author see "This Week's Issue," page 1344.

Toward the end of this, the proliferative phase, though the corpus luteum has begun to form, the amount of progestin is small while the production of folliculin is at its height. During the last week of the normal cycle, however, the corpus luteum is in the ascendency, the proportion of progestin increases, and at the same time the endometrium noticeably changes. This is the secretory or functional phase. The epithelial cells which at the beginning of this phase have acquired glycogen open up and disgorge their contents into the gland lumen. As a result their surface is frayed and they gradually approach the cuboidal shape. The nucleus is somewhat larger and takes up almost one-half the cell again. The glands, increased in number and lying close together, become very tortuous folding in and out or twisting on their long axes so that a cross-section shows many papillary projections into the lumina. They are dilated to several times their original diameter. The stroma is now widely distended with fluid and in the upper portion, especially, filled with extravasated blood. The arterioles are many, large, and engorged. In many places, the histiocytes of the stroma have increased in size, the nuclei having swollen some, but the cytoplasm more, so that many have now become large enough to be termed predecidual cells.

After two or three days of approximately this condition the mucosa goes on to form decidua if impregnation has occurred and the corpus luteum has grown, or to exfoliate and contract, if failure of impregnation allows regression of the corpus luteum. Such is normal menstruation.

The appearance of cyclic sanguineous flow, however, at least in certain monkeys, is no assurance that both the proliferative and secretory phases of endometrial activity, described above, have occurred. Hartman and others have shown that in the absence of the corpus luteum there is a cyclic bloody discharge in monkeys, and Corner has produced this in spayed animals by the use of theelin alone. The studies reported here were undertaken in part to test the significance of these findings in clinical gynecology.

Folliculin (in the form of Progynon-B) alone, and the same folliculin followed by corporin in the form of Proluton-B* were given to five patients with amenorrhea of at least a year's duration, in this attempt to study the normal influence of the follicular apparatus on the human endometrium. All medication was given deep in the gluteal muscles. Apparently normal menstruation promptly ensued in four cases and slight staining in the fifth. Biopsies of the endometrium were obtained before, during and after the treatment in one case, and before and after in three others, in an effort to identify the specific effects of each hormone. This was done by a modified Klinger and Burch suction technique. A simple open tube was used, 3 mm. in diameter with a curved, sharpened and notched hood over the uterine end made by prolonging and bending over one-quarter of the wall of the tube to within 3 mm. of the opposite side, leaving the lateral walls open. This was attached by a short rubber connection to a tight glass syringe. A cock was placed in the proximal end of the tube to insure maintenance of negative pressure in it during its withdrawal from the uterus after the syringe was removed. The contents stripped from the uterus by gentle stroking of the curette and sucked into the tube by the syringe, were then washed into a bottle with 10 per cent formalin. This procedure, simple to execute, is but moderately painful and for such a short time as to be not objectionable to the patient†.

Kaufmann in 1932 at the Charité in Berlin using the same preparations as in these experiments obtained what he considered full progestational response from the endometrium. Werner and Collins working with castrated women, as well as Kaufmann working with intact women with amenorrhea obtained proliferating endometrium and subsequent bleeding with only folliculin. The purpose of the trials reported here was to repeat Kaufmann's work as well as to test if possible the value of the suction technique in studies of the endometrium. If the specific effects of each hormone on the endometrium can be thus determined, such a method offers a simple objective test of the normality of the follicular apparatus. The former common clinical assumption that the ovary is functioning properly and ovulation occurring, if menstruation takes place regularly, is of course no longer justified. Bleeding from the interval type of endometrium, produced if only folliculin is exhibited, has been repeatedly brought about in human beings. (Kaufmann, Werner and Collins.) As has been said, it occurs normally during the non-mating season in monkeys (Hartman, Corner) when follicular development is but partial, ovulation does not take place, and no corpus luteum is formed. On the other hand failure to menstruate in a mature human female can no longer be always attributed to persistent corpus luteum, a fallacy based on the probability that the true corpus luteum of pregnancy prevents menstruation in the first few weeks, and that in the nonpregnant the ripe, false corpus luteum inhibits the bleeding which will occur when the luteal body regresses. In some of the amenorrheics at least, as is the case in the four described here, not only is there no probable corpus luteum effect demonstrable in the endometrium before treatment but not even any extensive folliculin effect.

*The materials used in the study were generously supplied by Schering Corporation of New York.

†A suction curette, as described, may be obtained from Hiller & Heuser, Cambria Street, Boston.

CASE REPORTS

108/67 L.——, aged 33. 1 ch. 1925. Cta. every 3-4 mos. until amenorrhea began July, 1931. Some staining for 1 wk. April 7 to April 14, 1932. Endometrium on April 7 characteristic of late proliferation phase. No clear evidence of secretory activity.

Specimens of endometrium at various times during 1933 after folliculin by mouth showed dysplasia of varying degrees.

Dec. 8. Biopsy: The endometrium was again back to the resting, almost atrophic condition usually seen before treatment. Fig. 1.

Jan. 5. The same.

Jan. 5, 8, 12, 16, 19—10,000 r.u. Progynon-B each day.

Jan. 24, 25, 26, 27—10 rab. u. Proluton-B each day.

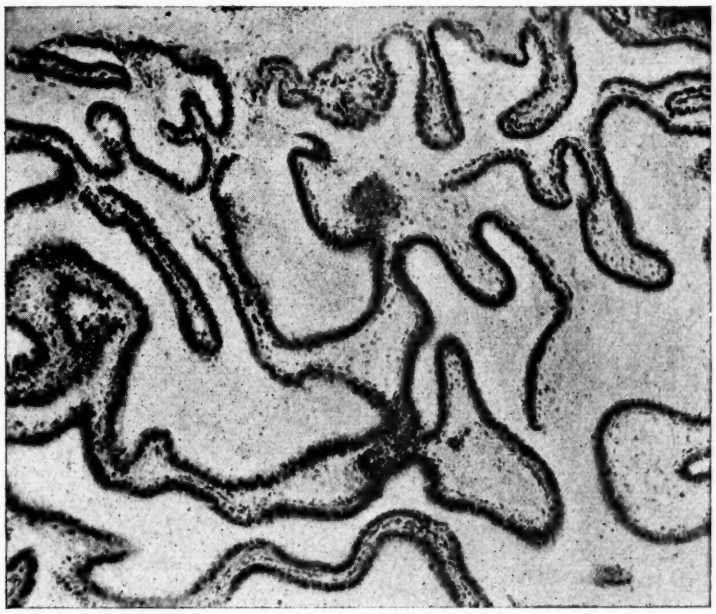

FIG. 1. L. 108/67. Dec. 8, 1933. Amenorrheic before treatment. Scant specimen. Thin mucosa, no glandular stroma obtained. Dense low columnar surface epithelium. Rare mitotic figures. Early resting endometrium. (120 ×.)

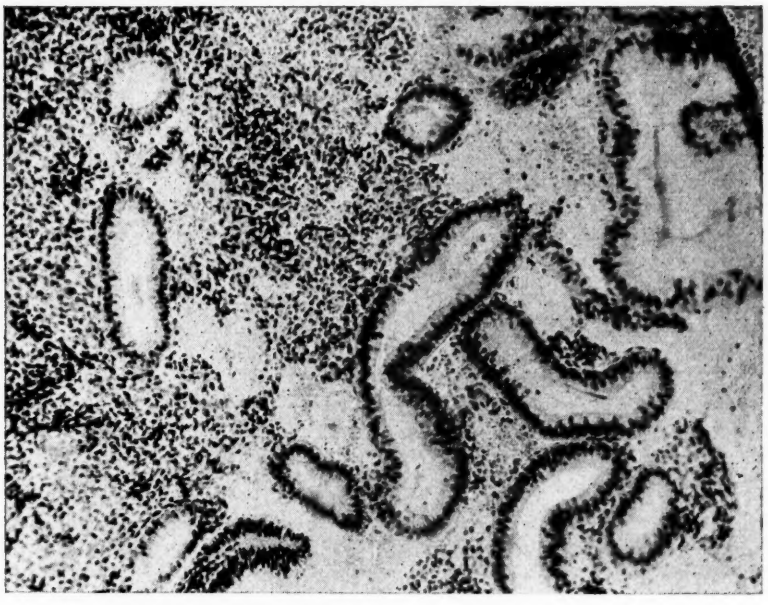

FIG. 2. L. 108/67. Jan. 27, 1934. Amenorrheic after treatment with 50,000 r. u. Progynon-B and 30 rab. u. Proluton-B. Two days before apparently normal scant menstruation. Hyperplasia of glands. Swollen vacuolated tall columnar epithelial cells. Decrease in density of stroma. Swelling of many stroma cells. Extravasation of blood. Early secretory endometrium. (120 ×.)

Jan. 27. Biopsy: Functioning endometrium. Fig. 2.

Jan. 29. Flowed. Slight staining Jan. 30 and 31.

109/122 R.——, aged 29. 1 ch. 1929. Amenorrhea since.

Various treatments with folliculin and Antuitrin-S without relief. Specimens in Nov. and Dec., 1933 were too small for diagnosis, thus strongly suggesting a thin atrophied endometrium.

Jan. 12, 16, 19, 23, 26—10,000 r. u. Progynon-B each day.

P. C. C.——, aged 26. M. 3 yrs. Sterility 1 yr. No children.

Cta. 13, reg. until cta. Sept. 1932. Amenorrhea since. Mild hot flashes 1-2 times a day. No gain in wt. B. M. R. 0-1 per cent.

Sept. 2, '33. Biopsy: Atrophied endometrium. Fig. 4.

FIG. 3. R. 109/122. Feb. 2, 1933. Amenorrheic after treatment with 50,000 r. u. Progynon-B and 30 rab. u. Proluton-B. Endometrium characteristic of early secretory phase with functioning gland epithelium. Slight enlargement of stroma cells in many places and extensive extravasation of blood. (120 ×.)

FIG. 4. P. C. C. Sept. 2, 1933. Amenorrheic. Before treatment. Atrophied endometrium. (120 ×.)

Jan. 30, 31. Feb. 1, 2, 3—10 rab. u. Proluton-B each day.

Feb. 2. Biopsy: Functional endometrium with some dysplasia. Fig. 3.

Feb. 4. Flowed, staining seven napkins. Feb. 5. Flowed, staining two napkins. Feb. 6. Stained.

Jan. 12, 16, 19, 23, 26—10,000 r.u. Progynon-B each day.

Jan. 30, 31. Feb. 1, 2, 3—10 rab. u. Proluton-B each day.

Feb. 2. Biopsy: Functioning endometrium. Fig. 5.

Feb. 4 to Feb. 9 inclusive. Flowed, staining 2 n.p.d.

March 9. Biopsy: Atrophy of endometrium.
March 9, 13, 16, 20, 23—10,000 r.u. Progynon-B each day.
March 24. Biopsy: Proliferating endometrium. No secretion.
March 25, 26, 27. Flowed, staining 2 n.p.d.

Aug. 24, '32. D. & C. Endometrial dysplasia.
No flow since. Mild hot flashes for 1 yr.
Aug. 12, '33. Ut. normal size and position.
Biopsy: Atrophy of endometrium.
Nov. 2, 4, 6, 8, 10, 13, 15—10,000 r.u. Progynon-B each day.

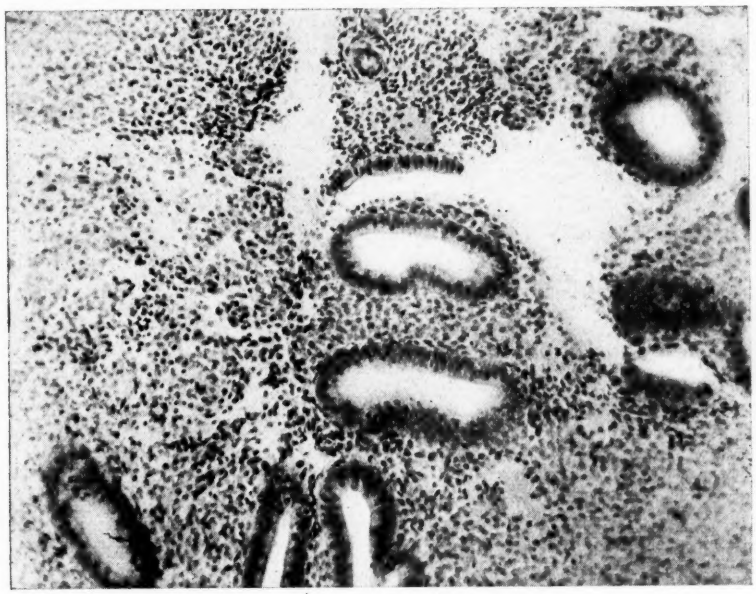

FIG. 5. P. C. C. Jan. 12, 1934. After 50,000 r. u. Progynon-B and 30 rab. u. Proluton-B. Mild secretory phase with swelling of nuclei of glandular epithelium and beginning predecidual change in stroma cells. (120 ×.)

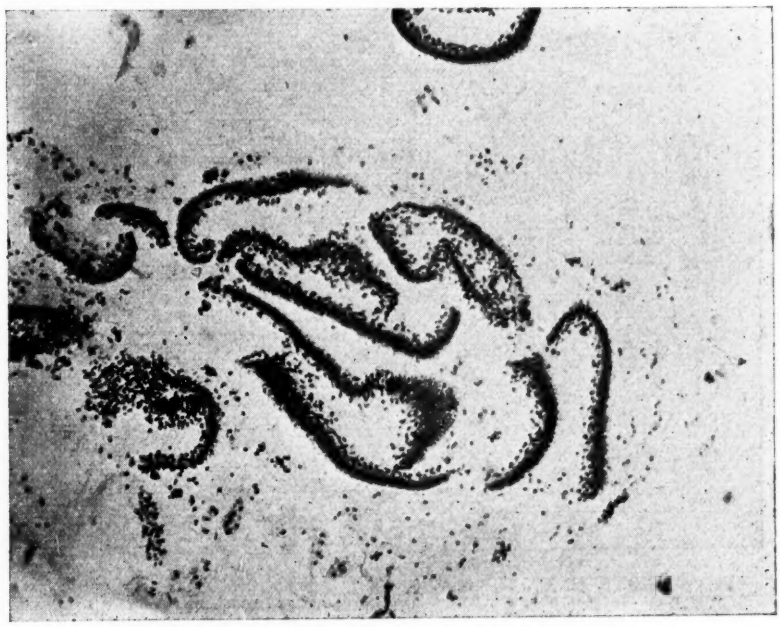

FIG. 6. P. C. M. Aug. 12, 1933. Amenorrheic before treatment. Atrophy of endometrium. (120 ×.)

P. C. M.—, aged 24. Cta. 15—25-29d—7d—4 n.p.d. No skip.
P. H. Rt. oöphorectomy for cyst 1930. 1st preg. began Dec. 1931. Misc. Feb. 1932. Flow frequent and irregular until June 1932 when it occurred daily. X-ray treatment in July failed to stop it. Aug. 1932 five times 500 r.u. Ant-S on alternate days without effect.

Nov. 17. Biopsy: Proliferating endometrium.
Nov. 17. 10,000 r.u. Progynon-B and 10 rab. u. Proluton-B.
Nov. 20, 22, 24, 27, 29—5,000 r.u. Progynon-B and 10 rab. u. Proluton-B each day.
Nov. 29. Biopsy: Functioning endometrium. Fig. 7.
Dec. 3 to 12 inclusive. Flowed 3-4 n.p.d.

Jan. 11 to Jan. 25 inclusive—5 times 10,000 r.u. Progynon-B.
Jan. 29 to Feb. 3 inclusive—5 times 10 rab. u. Proluton-B.

Jan. 9, 12, 16, 19, 23—10,000 r.u. Progynon-B each day.
Jan. 25, 26, 27, 28—20 rab. u. Proluton-B each day.
Jan. 30. Brown staining.

FIG. 7. P. C. M. Nov. 29, 1933. Amenorrheic. After treatment with 100,000 r. u. Progynon-B and 50 rab. u. Proluton-B. Atypical early functioning endometrium with swelling of glandular epithelium, absence of mitoses and generalized extravasation of blood. No predecidua seen. (120 ×.)

FIG. 8. P. C. M. Mar. 3, 1934. Amenorrheic after 50,000 r. u. theelol sub. cu. Late proliferating endometrium without secretory activity of glands or swelling of stroma cells. Some extravasation of blood. (90 ×.)

Feb. 4 to 9 inclusive. Flowed, staining 3-4 n.p.d.
Feb. 10, 13, 17, 20, 24. Theelol* 10,000 r.u. each day.
March 3. Biopsy: Proliferating endometrium. Fig. 8.
March 5, 6, 7. Flowed, staining 4 n.p.d. Severe cramps.

P. C. W.——, aged 23. Cta. 16, reg. for 3 mos.—28d 4d—4 n.p.d. Skipped Nov. 1929 to Sept. 1930. Few cta. 1931 and 1932. Cta. March, April, May, 1933. Amenorrhea since. No hot flashes. Slt. breast symptoms.

*Generously supplied by Parke, Davis & Company.

REMARKS

In considering the preceding experiments it must not be forgotten that all these women were intact mature females of childbearing age, and although amenorrheic for many months before the observations recorded here were made, none of them gave such evidence of ovarian atrophy as we see in normal women long past the

menopause. In such women as these, a sporadic autogenous menstruation is not at all impossible or even unlikely. It merely seems as if this were not the case with these particular women, and that therefore the endometrial changes described can probably be considered due to the preceding medication.

Likewise we must remember that all parts of the uterine lining do not at any one time conform to a given cytological set-up. This difference in response to endocrine stimulation on the part of various sections of the endometrium may be teleological;—witness the localization of decidua in the monkey. (Wislocki.) Perhaps something similar occurs in human beings, and will explain the occurrence of placenta previa as due to a lowering of the threshold for decidual change in a portion of the uterus not usually susceptible, or a resistance where it normally occurs. It may at all events be said that in these as well as other studies of the endometrium to be reported later, there has been not only a great similarity in all the fragments of mucosa obtained at any one time, but these have agreed in cytological picture with what we would expect from experience with laboratory animals and surgical specimens from human beings. Regarding deciduomata, it may be said that in further studies not reported here, the greatest variation among the fragments was in the degree of predecidual response on the part of the stroma cells. Because of the uniformity of the fragments and because of their agreement with theoretical expectancy it seems as if the Klinger-Burch suction curette is a very serviceable instrument, and that the specimens obtained give a correct picture of endometrial response.

If this is so, and these women can be assumed to have had quiescent ovaries during the trials, it has been demonstrated again that in human females proliferation of the endometrium is caused by folliculin. If furthermore, we are willing to identify human with monkey physiology it has been reciprocally shown that Proluton-B is an active preparation of corporin, and that the secretory activity of the glandular epithelium is a specific corporin effect. Kaufmann's experiments would be thus corroborated.

The possibility of anovulatory flow has also again been demonstrated. We know that this occurs in human beings with granulosa cell tumors. To occur in otherwise normal human beings, sterility patients, for instance, we need only assume a sufficient folliculin production in follicles which do not thereby rupture with ovulation. I believe the frequency of this has been overestimated, a creed which we are now using the suction curette to test.

In the experiments reported, the time at which the flow occurred, after the injections were stopped, is interesting. In none did staining appear during the treatment. In L——. and R——. the flow appeared six days after the last injection of Progynon-B. during the first five of which corporin was given. M——. in one experiment, the second with her, waited ten days after the last injection of Progynon-B before flowing, but during the first nine of these ten days Proluton-B was being given. She, too, then, flowed the day after Proluton-B was stopped. In the first trial with M——, she waited four days after the last Proluton-B injection; but she was getting Progynon-B with each Proluton-B. It seems therefore as if perhaps folliculin has a latent protective period for four days when given in these doses, but that Proluton-B protects the endometrium from flow only while it is given. As exceptions, C——, in the second experiment, with Progynon-B waited only two days before flowing after the last injection, whereas M——, in the third trial with her, when only theelol was used, did not flow until nine days after the last injection.

From the study of the endometria reported here and from many others it is clear that in neither folliculin nor in corporin have we the whole secret of bleeding. It seems true, however, that massive extravasation of blood into the stroma takes place when folliculin is acting on the endometrium, but that the mucosa holds it in bounds while either folliculin or corporin is active.

What is the clinical value of such findings as these? It will be noted that to secure most of the periods of flow from secretory endometrium, 50,000 r.u. of folliculin and 50 rabbit units of corporin were used during the three weeks preceding the flow. Attempts demonstrably to influence the endometrium with smaller doses were unsatisfactory. The present cost of effective therapeutics, then, at least five hundred dollars a month, is prohibitive, when one considers that the only human benefit from the flow is psychic. But are we sure that only the endometrium is objective in this reaction to the ovarian hormone? There is much theorizing and a little experimental evidence that the ovary, too, possibly secondarily to anterior pituitary changes, is responsive to its own secretions. If this be so, and we can learn the mechanism, may we not eventually strike nearer the source as well as the disadvantage of amenorrhea, by stirring up the ovary through its own hormone?

SUMMARY

The cyclic changes in the endometrium of mature human beings have been described and correlated with synchronous changes in the ovaries.

A modification of the Klinger-Burch suction curette has been described and shown to be of service in the study of the endometrium and

through this of female sex-endocrine physiology.

Seven instances of artificial menstruation in four patients have been described. In three instances the flow followed injections of only folliculin; in the other four folliculin was followed by corporin. When only folliculin was used the flow is shown to have been from endometrium in the proliferating phase. When both were used a true secretory endometrium was generated.

The changes in the endometrium were accomplished only with relatively huge doses of hormones.

NOTE

The writer is gratefully indebted to Dr. Frank A. Pemberton and Dr. George Van S. Smith for essential assistance in the work reported.

He wishes also to thank the Schering Corporation for the supplies of Progynon-B and Proluton-B; and, Parke, Davis and Company for supplies of theelol.

Because the colorless prints of the stained sections of endometria represent them so poorly, the writer will be glad to lend the sections to those who wish to study them.

REFERENCES

Allen, E.: The menstrual cycle of the monkey, Macacus Rhesus. Contrib. Embryol. 19: 1, 1927.

Bain, C. G.: Observations made during a study of the cytology of the endometrium. Am. J. Clin. Path. 3: 237, 1933.

Bartelmez, G. W.: Histological studies of the menstruating mucous membrane of the human uterus. Contrib. Embryol. 24: 143, 1933.

Corner, G. W.: Ovulation and menstruation in Macacus Rhesus. Contrib. Embryol. 15: 75, 1923.

Hartman, C. G.: Studies in the reproduction of the monkey Macacus (pithecus) Rhesus, with special reference to menstruation and pregnancy. Contrib. Embryol. 23: 1, 1932.

Hirsch, E. F., and Jones, H. O.: Behavior of the epithelium in explants of human endometrium. Am. J. Obst. & Gynec. 25: 37, 1933.

Kaufmann, C.: Die Behandlung der Amenorrhöe mit hohen Dosen der Ovarialhormone. Klin. Wchnschr. 12: 1557, 1933.

Kaufmann, C.: Umwandlung der Uterusschleimhaut einer kastrierten Frau aus dem atrophischen Stadium in das der sekretorischen Funktion durch Ovarialhormone. Zentralbl. f. Gynäk. 56: 2058, 1932.

Kaufmann, C.: Echte Menstruation bei einer kastrierten Frauen durch Zufuhr von Ovarialhormone. Zentralbl. f. Gynäk. 57: 42, 1933.

Kaufmann, C.: Echte menstruelle Blutung bei kastrierten Frauen nach Zufuhr von Follikel- und Corpus luteum-Hormon. Klin. Wchnschr. 12: 217, 1933.

Novak, Emil: Clinical Characteristics of Normal Menstruation. Obstetrics and Gynecology by Curtis, A. H., Philadelphia: W. B. Saunders Company, 1934. Vol. I, Chap. 4, p. 283.

O'Leary, J. L.: Form changes in the human uterine gland during the menstrual cycle and in early pregnancy. Am. J. Anat. 43: 289, 1929.

O'Leary, J. L.: A quantitative study of the relation of nucleus to cytoplasm in the human endometrium during the menstrual cycle. Anat. Rec. 50: 33, 1931.

Papanicolaou, G. N.: Epithelial regeneration in the uterine glands and on the surface of the uterus. Am. J. Obst. & Gynec. 25: 30, 1933.

Schröder, Robert: Anatomische Studien zur normalen und pathologischen Physiologie des Menstruationszyklus. Arch. f. Gynäk. 104: 27, 1915.

Schröder, Robert: Die klinischen Anwendungsgebiete der Sexualhormonpräparate (ihre klinischen Teste). Deutsche med. Wchnschr. 55: 3, 1929.

Wislocki, G. B.: Studies made by him in conjunction with Streeter, G. L. Personal Communication.

Klinger, H. J., and Burch, J. C.: Suction in obtaining endometrial biopsies. J. A. M. A. 99: 559, 1932.

CONGENITAL SCOLIOSIS*

A Review of Seventy-Seven Patients

BY JOHN G. KUHNS, M.D.†

CONGENITAL scoliosis is the name usually given to lateral curvature of the spine which is present at birth and which is due to abnormalities in the vertebrae or their contiguous structures. There has been a tendency in recent years to group as congenital scoliosis only those cases which have shown vertebral deformation in roentgenograms[1] interpreted as congenital in origin. But reports have appeared in the literature[2] and observation has also been made in this clinic of definite scoliosis present at birth without any changes in the spine demonstrable in roentgenograms. This latter type of scoliosis is not common. It usually corrects readily under treatment and subsequently remains normal. In the series of cases reviewed here such congenital scoliosis without demonstrable abnormalities in the spine has been purposely omitted.

This study was made of all the children with congenital scoliosis who were seen in the Scoliosis Clinic of the Boston Children's Hospital from the organization of the Scoliosis Clinic in 1908 until the present time. There were seventy-seven children with this type of deformity among 1483 cases of scoliosis treated in the clinic; of these 681 were diagnosed as structural scoliosis and 802 as physiological or functional scoliosis. This would give a frequency for congenital scoliosis of eleven plus per cent in the total number of cases of structural scoliosis. There were fifty-six girls and twenty-one boys. In these seventy-seven children data were collected in regard to the family and prenatal histories, the presence of other congenital defects, the type of curve, the nature of the spinal abnormalities, the kind and duration of treatment and the present condition, particularly in regard to the function of the spine.

Congenital scoliosis was thought to be extremely rare before the present century. First described by Méry[3] in 1700, Coville[4], in 1896, found it only once in an examination of one thousand children and was able to collect only a few cases from the literature. With the advent of the roentgenogram this deformity was discovered more easily, so that now it is not considered uncommon. There are no figures available in regard to its relative frequency in comparison with other deformities appearing at birth. Statistical studies of lateral curvature

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show that the incidence of congenital scoliosis in structural scoliosis varies between three per cent[5] and eleven per cent[6].

Small groups of children suffering from congenital scoliosis have been studied by a number of observers. The vertebral abnormalities seen in roentgenograms were described by Putti[7] who made a careful review of the theories of their pathogenesis. Sever[8] studied a number of children with congenital defects of the spine and ribs from the standpoint of their etiology. Wierzejewski[9] divided congenital defects of the vertebrae into five groups: 1, numerical variations; 2, disturbances in segmentation; 3, separation of the vertebra into parts; 4, wedge-shaped vertebrae; 5, irregularities in the development of the spinal joints. Hodgson[10] in a discussion upon the grouping of these deformities showed the difficulty that one meets in finding a classification adequate for all of these abnormalities.

There are many theories upon the etiology of this condition[11]. Many of them are now only of historical interest. From the studies of Bardeen[12] and others[13], it has been shown that these abnormalities arise before ossification occurs in the spinal column, that is, during the first six weeks of fetal life. The precursors of the vertebrae which develop from the sclerotomes are to a large extent potentially equal; their subsequent development (that is, their segmental differentiation) depends largely upon their regional environment. A temporary disturbance in the development of adjacent muscles or viscera could cause a vertebra in a spinal segment to be different from the others as is occasionally observed at the dorsolumbar and lumbosacral region. Putti[7] believed that a study of the phylogenetic relationship to lower vertebrates would help in the explanation of many vertebral deformities. Coville[4] and Mouchet[11] have suggested a disturbance in the nutrition of the vertebral body at the time of chondrification as a cause of some of these abnormalities. Stockard[14] and others have shown that thermal and chemical changes can modify greatly the development of the embryo. Many factors may play a part in arresting, retarding, or accelerating the development of a special part such as a vertebra. Reid[15] has suggested disease in the mother during early pregnancy as a possible cause. How much we can modify these suggested causes in preventing vertebral deformities must remain conjectural in the present state of our knowledge.

There is little evidence to support the theory that these abnormalities are hereditary except in rare instances of multiple physical deformities found where tendencies to such malformation are present in both parent cells[16]. In this group of cases a history of physical deformities in the immediate family was obtained in only two cases, one a unilateral club-foot in a brother, the other, deaf mutism in a sister. The prenatal histories revealed nothing unusual in any of the cases where they could be obtained. Two of the children in this group were born prematurely, one at the eighth month and one at eight and one-half months of the pregnancy.

The types of curves found, showed no definite predilection to any particular form of curvature. Table 1 gives the frequency of the different kinds of curvature. Most of the curves were double curves; those with convexity to the right in the dorsal region, and to the left in the lumbar region, were the most common. There was one triple curve. In practically all instances the curve whether single or double in form, remained the same in form although not in severity throughout the period of observation. This characteristic of relative fixation of the curvature in congenital scoliosis has been mentioned by a number of observers[17].

TABLE 1

TYPES OF CURVES

Left cervical right dorsal	2
Left cervicodorsal, right dorsolumbar	13
Left dorsal, right lumbar	8
Left cervical, right dorsal, left lumbar	1
Left dorsal	5
Left lumbar	5
Right cervical left dorsal	2
Right cervicodorsal, left dorsolumbar	3
Right dorsal, left lumbar	18
Right dorsal	16
Right lumbar	4

Congenital scoliosis is frequently not noticed as are other forms of scoliosis until severe deformity occurs. In these children, the curvatures were noticed at birth in only eighteen, during the first six months in eleven, before two years in nineteen, and after six years in fourteen. No subjective symptoms were present in any of the cases. Other signs besides the curvature, which led the parents to seek treatment, were a high shoulder due to an associated Sprengel's deformity in one child. A short neck due to congenital abnormalities of the cervical spine[18] led to the diagnosis in two children. Hypertrichosis over the spinal column caused the parents to seek medical advice in three instances. Asymmetry of the body, exclusive of the spine, was found by two of the mothers.

It is almost impossible to group cases of congenital scoliosis according to the type and extent of the spinal deformity. While certain kinds of deformities of the vertebrae and ribs appear again and again, the pattern is never duplicated, and there are no two spines with like deformities in this entire group. Table 2 gives the frequency of the usual deformities in

this group of cases. The numerals refer to the number of cases in which the listed deformity was observed.

TABLE 2

SPINAL DEFORMITIES

Absence of ribs	
Unilateral	7
Bilateral	3
Supernumerary ribs	
Unilateral	1
Bilateral	2
Fusion of ribs	
Unilateral	6
Bilateral	3
Change in number of vertebrae (Cervical, dorsal and lumbar spine)	
Less than 24	3
More than 24	1
Change in distribution of vertebrae	
Six lumbar and eleven dorsal	2
Four lumbar and thirteen dorsal	1
Fusion of vertebrae	
Cervical region	1
Dorsal region	2
Lumbar region	2
Bifid vertebrae	
Cervical region	1
Dorsal region	7
Lumbar region	1
Hemivertebrae	
Cervical region	3
Dorsal region	5
Lumbar region	3
Wedge-shaped vertebrae	
Cervical region	1
Dorsal region	1
Lumbar region	1
Spina bifida occulta	21
Platyspondylisis	4

In only three instances was a single deformity found. In all of the others multiple spinal deformities were present. In one case a child, who is now five, almost all of them were present (fig. 1). This child has a severe right dorsal-left lumbar curvature with marked asymmetry of the thorax, but is very active nevertheless and has no subjective symptoms. More deformities, particularly in the laminae and articular facets will probably become evident as ossification progresses in the vertebrae of the younger children. Bifid vertebrae and hemivertebrae were the most common deformities found[19]. Böhm[20] had considered such abnormalities as the cause in certain cases of developmental scoliosis in his study in 1906. The findings in the roentgenograms agreed with the observation of Mouchet and Roederer[21] that hemivertebrae were practically always associated with more important deformities elsewhere in the spine. In this series no spine showed a single hemivertebra as the only abnormality.

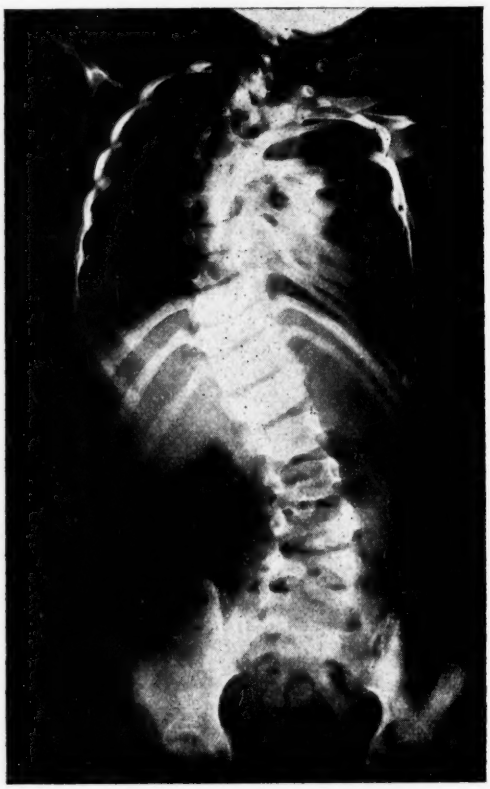

FIG. 1. Roentgenogram of child of five mentioned in text. There are twelve ribs on the right side and eleven on the left side. There is fusion of the ribs from the third to eighth ribs on the left side. There is a spina bifida occulta of the entire dorsal and lumbar spine. There are deformities of all of the dorsal vertebrae.

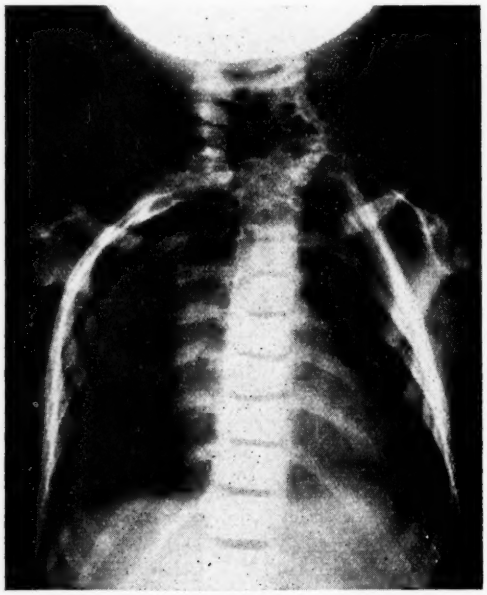

FIG. 2. Roentgenogram of child of four showing deformities confined to the cervicodorsal junction. The fourth and fifth cervical are fused on the left side. The sixth cervical shows a hemivertebra on the right side. The seventh cervical is bifid.

Congenital defects were more commonly observed at the cervicodorsal and dorsolumbar regions of the spine, points where anatomical structures as well as function in the vertebrae are differentiated (fig. 2). Costal anomalies were associated in every instance with extensive vertebral defects. Segmental variations, i.e., a difference in the number of cervical, dorsal, and lumbar vertebrae, were observed in only four cases. Wedge-shaped vertebrae were seen in the roentgenograms from four spines. In two where earlier studies had not been possible it could not be determined whether the wedge-shaped vertebrae were congenital or developmental deformities. Platyspondylisis[20], an unusual flattening of the vertebrae, was seen four times. All of these defects remained practically unchanged in subsequent roentgenograms throughout the growing period.

Associated abnormalities in other parts of the body are found not uncommonly with congenital scoliosis. In one child there was an absence of all of the fingers. One child had syndactylism. Clinodactylism[23], a flexion deformity of the fingers due to contracture in the subcutaneous tissues on the palmar side of the fingers, was observed in one case. A Sprengel's deformity was present in three. In two children cervical ribs were found. A unilateral absence of the pectoralis major muscle was observed in one boy. One child showed congenital deafness in both ears. This series of associated deformities, while too small to give much weight to any argument, makes one wonder if in these instances one was dealing with a weakened but visible germ plasm. Later studies of the offspring of these individuals will be of interest.

Many different opinions in regard to the prognosis of congenital scoliosis have been given in the past. This has resulted probably from the great variation in the kind and extent of spinal deformity. Congenital scoliosis follows the same mechanical laws in its progression or its improvement as any other type of scoliosis. The greater rigidity of the spine which is usually found in congenital scoliosis tends to make its progression somewhat slower and its correction somewhat more difficult. Extensive costal and vertebral anomalies which are always associated with muscular defects frequently lead to extensive asymmetry of the thorax, much worse than one would expect from the extent of the scoliosis, as Sternberg[24] has shown. In spite of these, however, function is carried out, by what structures are present, surprisingly well.

Some of the less serious cases with vertebral anomalies which do not alter seriously the alignment of the spinal column seem to remain practically unchanged whether treatment is given or not. Each case is an individual problem and no natural course can be plotted for any single case or group of cases as the study of the end results in this series shows.

We believe that a fair prognosis is justifiable in congenital scoliosis, if the full coöperation of the child and the parents can be secured. Our own experience confirms the statement, frequently made, that increasing deformity is readily prevented, and that in infancy the scoliosis is often almost completely corrected without great difficulty. Unfortunately, many of the cases studied here have not shown so happy an outcome. Treatment was often irregular, soon discontinued, or improperly followed. In recent years due to the economic depression, many children have changed their residences without leaving a trace whereby our social service workers could follow them. Irregular practitioners, and appliances advertised with extravagant claims, have misled not a few.

Our observations lead us to conclude that congenital scoliosis is never wholly cured except in the occasional case, with mild deformity, that is followed carefully from earliest infancy until growth is obtained. The greatest improvement in bodily symmetry and the correction of the scoliosis has been seen in those children who have been followed carefully since birth. We are accustomed to measure improvement by two methods, first, by the general appearance and functional ability of the body, often the most convincing to parents, and secondly, by such clinical measurements as we can make of the spine and thorax including photographs and x-ray examination. As table 3 shows, a large number of these children demonstrated practically no change in their scoliosis. In two of these no treatment of any sort had been given; they were simply kept under observation for a number of years. Both of these were mild curves with only slight vertebral abnormality. Failure to show improvement in twelve resulted from the severity of the spinal deformity, from bad judgment in the type of treatment given, or from poor coöperation on the part of the patient. Two of these children have died, one, a girl of twenty, with scoliosis unchanged, from pneumonia, and the other, a girl of seventeen, whose scoliosis had grown worse, from heart disease. Thirteen children could not be traced.

TABLE 3

END RESULTS

Cured	0 (known)
Improved	24
Condition unchanged	26
Worse	12
Condition unknown	13
Dead	2

Treatment in this group of children varied greatly in this twenty-five year period as is shown in table 4. While noteworthy advances in the treatment of scoliosis have come in the last decade, efficient treatment for all cases of congenital scoliosis is still unknown[25]. The earlier treatment is begun and the more uninterrupted-

ly it is continued to the end of the growing period the better the outcome will be.

Eight children were given no treatment. Three of them came simply for consultation, two were kept under observation and in the other three, treatment was refused. Exercises alone have been rarely used except in the very mild forms of congenital scoliosis. The large number given in table 4 includes many where a preliminary series of exercises was given preparatory to the use of apparatus but where, as is found in all outpatient clinics, treatment was discontinued before the second step in the treatment was reached. Following the observations of Bradford and Lovett in this field, exercises were given in addition to support in almost all of the cases. Plain jackets were used for simply holding the spines when no further correction could be obtained, and support of the spine was necessary. They were used instead of more elaborate braces, usually for the sake of economy. "Derotation jackets" were found effective only in the exceptional case. Because of the fixed anatomical abnormalities, pressure upon the ribs rarely produced much change in the deformity. The author, who has used both "derotation jackets" (with pressure upon the prominent ribs) and "lateralization jackets" (with hinge and lateral turnbuckle), has observed much more effective correction from the latter method in congenital scoliosis. Posterior plaster shells for the recumbent treatment of infants were used in thirteen cases. In all of these children the shell was followed by some form of ambulatory support if the children remained under treatment.

TABLE 4

TREATMENT

Treatment	Cases	Present Condition			
		Improved	Unchanged	Worse	Unknown
No treatment	8	0	4	0	4
Exercises alone	21	5	9	2	5
Turnbuckle jacket	18	10 (1 dead)	5	3	0
Plain plaster jacket	6	2	2	1	1
Plaster shell followed by turnbuckle jacket	8	4	2	0	2
Plaster shell	5	0	1	3	1
Derotation jacket	3	1	1	1	0
Bradford frame	2	0	1 (dead)	1	0
Corset	2	1	1	0	0
Operations					
Fusion of spine	2	1	1	0	0
Lowering of scapula	2	1	0	1	0

Good results can be obtained by many methods, as the end-results from this clinic have shown. Adequate treatment for congenital scoliosis must include: 1. Mobilization of the rigidity and lessening of the curvature of the spine, which should be carried out not too rapidly or forcefully. 2. Strengthening of the muscle groups which support the spine, by exercise. 3. The development of the best posture obtainable with the deformities which are present. 4. Such upbuilding measures as are indicated to improve the general health. Any treatment that is undertaken should continue until full growth in stature has occurred, since the changes which come with increase in height modify the mechanics of the spine to a certain degree throughout the growing period.

For congenital scoliosis in infancy we have found the most effective treatment to be the use of a molded plaster shell which holds the spine in a slightly overcorrected position. This can be made while the child is held with the curvature overcorrected as described by Harrenstein[2] or a turnbuckle shell can be given, as reported by Brewster[26]. Such procedures have been found to be far more effective than the strapping of the child to a Bradford frame. Where there are severe congenital abnormalities it has been found advisable at times to continue treatment in recumbency with a plaster shell, long beyond the usual period for beginning to walk. In the less severe cases at the usual time for walking, a plain plaster jacket is applied with the child in suspension, and the child is permitted to creep and walk in this. Where much curvature persists, a turnbuckle jacket is used[27]. Reinforced corsets of canvas or leather have been found unsatisfactory in maintaining the correction in the spine except in the congenital scoliosis of mild degree.

In the last ten years exercises have been given in practically all cases of congenital scoliosis in conjunction with some type of support. These exercises have been of two kinds; mobilizing exercises to overcome contractures of the muscles and ligaments, as described by Lovett[28], in order that the curvature might be lessened, and postural exercises to secure better general muscular development, to obtain better respiratory function and to improve the balance of the spinal column. In a number of the cases where partial correction of the curvature had occurred, the children were able to maintain the improved position with their own musculature. Attempts at correction both by turnbuckle jackets and exercises were continued as long as im-

provement in the spinal deformity was observed. Jackets and other spinal supports were removed gradually when no further correction could be obtained, and when the muscles which support the spine were well developed and the poise of the body was good.

Vigorous redressment as advocated by earlier writers has not been used. The rigidity and the bony deformities make it both a difficult and dangerous procedure in congenital scoliosis. Correction even by slow stretching is a sufficiently difficult procedure except in the very young. We have found that it is much easier to start in infancy and guide the spine into straighter growth with the gradual increase in height than it is to correct deformities. Some improvement in the spinal and thoracic deformities can be obtained even in adults, but good functional as well as anatomic rehabilitation, at least in the severe cases, can only be expected where the spine is made to grow relatively straight and is used from early childhood in as nearly normal function as possible.

Removal of a portion of a vertebra[29], or of a hemivertebra has been reported[30]. In none of the cases reported where this operation has been performed has sufficient time elapsed so that full appraisal of this therapy can be made. In practically all cases a hemivertebra or a wedge-shaped vertebra is found with other deformities in the spine. The successful removal of such vertebrae will only partially correct the disturbance of balance. While this procedure was considered in one case, it has not been performed in this clinic. An attempt has been made to prevent increase in deformity by early spinal fusion[31] in only one case. In this case while increase in the curvature has been helped materially by spinal fusion, support and supervision will be necessary for a number of years more. Fifty-two of the children in this series are still under treatment either in this clinic or under the care of other physicians.

Conclusions: 1. Congenital scoliosis is not an uncommon spinal deformity. It comprises 11 per cent of the cases of structural scoliosis seen at the Boston Children's Hospital. 2. The vertebral deformities occur in early fetal life. We do not know as yet how to prevent their occurrence. 3. Early diagnosis is made too rarely. The deformity is usually the only physical sign. 4. Multiple deformities scattered throughout the spine were found in all except three children. 5. Treatment must begin early if good functional and anatomic correction is to be obtained. 6. Supervision must be continued until full growth has occurred.

REFERENCES

1 Kirmisson, E.: Scoliose congénitale. Rev. d'orthop. 1: 21, 1910.
2 Harrenstein, R. J.: Die Skoliose bei Säuglingen und ihre Behandlung. Ztschr. f. orthop. Chir. 52: 1, 1929.
3 Méry, R.: Hist. de l'acad. des Sciences. Paris, 1700.
4 Coville: De la scoliose congénitale. Rev. d'orthop. 7: 301, 1896.
5 Kirmisson and Saint-n: Pour servir à l'histoire de certaines scolioses anormales. Rev. d'orthop. 6: 218, 1895.
6 Mitchell, J. L.: The etiology and treatment of scoliosis. Arch. Surg. 16: 680, 1928.
7 Putti, V.: Die angeborenen Deformitäten der Wirbelsäule. Forschr. a. d. Geb. d. Röntgenstrahlen. 15: 65, 1910.
8 Sever, J. W.: Congenital anatomical defects of the spine and ribs. Boston M. & S. J. 186: 799, 1922.
9 Wierzejewski, I.: Über angeborene knöcherne Veränderangen der Wirbelsäule. Ztschr. f. orthop. Chir. 50: 603, 1928.
10 Hodgson, F. G.: Congenital deformities of the vertebrae and ribs. Report of four cases. Am. J. Orthop. Surg. 14: 34, 1916.
11 Mouchet, A.: Un cas curieux de scoliose congénitale dorsa-lombaire. Gaz. hebd. d. méd. 3: 469, 1898.
12 Bardeen, C. R.: The development of the thoracic vertebrae in man. Am. J. Anat. 4: 163, 1905.
13 Keibal, F. K. J., and Mall, F. P.: Human Embryology. Vol. I. Philadelphia: J. B. Lippincott Company, 1910.
14 Stockard, C. R.: An experimental study of twins, "double monsters," and single deformities. Am. J. Anat. 28: 115, 1921.
15 Reid, C. D.: Congenital malformations of the spine. New York State M. J. 19: 161, 1919.
16 Classen, K.: Vererbung von Krankheiten und Krankheits-anlagen. Arch. f. Rassenbiologie. 13: 31, 1918-21.
17 Port, K.: Die Pathologie und Therapie der Skoliose auf Grund von Röntgenstudien. Arch. f. orthop. u. Unfall-Chir. 26: 379, 1928.
18 Bertolotti, M.: Le anomalie congenité del rachide cervicale. Chir. d. org. di movimento. 4: 395, 1920.
19 Reccandte, M. A.: Contribution a l'étude des anomalies du développement du rachis. Rev. d'orthop. 18: 674, 1931.
20 Böhm, M.: The cause of so-called habitual lateral curvature of the spine. Boston M. & S. J. 155: 598, 1906.
21 Mouchet, A., and Roederer, C.: Scoliose congénitale. Presse méd. 30[2]: 577, 1922.
22 Lance, M.: Sur le diagnostic des platyspondylies congénitales. Soc. Nat. de Chir. 53: 1250, 1927.
23 Tomesku, I.: Kongenitale Deviationen der Phalangen. Arch. f. orthop. u. Unfall-Chir. 26: 126, 1928.
24 Sternberg, H.: Zur Prognose Angeborener Skoliosen. Arch. f. orthop u. Unfall-Chir. 33: 307, 1933.
25 Freiberg, A. H.; Silver, D., and Osgood, R. B.: Treatment of structural scoliosis. Am. J. Orthop. Surg. 13: 6, 1915.
26 Brewster, A. H.: Lateral structural curvature of the spine. Arch. Surg. 18: 1427, 1929.
27 Ober, F. R., and Ghormley, R.: Scoliosis. J. A. M. A. 90: 361, 1928.
28 Lovett, R. W.: Lateral Curvature of the Spine and Round Shoulders. Philadelphia: P. Blakiston's Son and Company, 1922.
29 Compere, E. L.: Excision of hemivertebrae for correction of congenital scoliosis. J. Bone & Joint Surg. 14: 555, 1932.
30 Von Lackum, H. L., and Smith, A. DeF.: Removal of vertebral bodies in treatment of scoliosis. Surg. Gynec. & Obst. 57: 250, 1933.
31 Hibbs, R. A.; Risser, J. C., and Ferguson, A. B.: Scoliosis treated by the fusion operation. J. Bone & Joint Surg. 13: 91, 1931.

THE ANEMIAS OF PREGNANCY*

BY MAX DAVIS, M.D.,† AND ELISABETH W. WALKER, A.M.†

THE problem of anemia during pregnancy has not received so much attention from the medical profession as it deserves. Very few clinics, and even fewer private practitioners, go to the trouble of performing routine blood counts and hemoglobin determinations on their pregnant patients, despite the fact that a patient with anemia is definitely less fit for the intense strain of labor. The attention of the obstetrician has been focused with great keenness, and justly so, upon the dangers of toxemia, but his interest should also be sufficiently aroused

*From the Robinson Memorial, the Obstetrical Department of the Massachusetts Memorial Hospitals, and from the Boston University School of Medicine. Delivered before the New England Obstetrical and Gynecological Society on November 30, 1932.

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to consider the anemia of pregnancy, which is an ever-present, though less threatening problem than the toxemias, and occurs in a far larger proportion of patients than do the latter.

Two distinct types of anemia occur during pregnancy—one, a typical secondary anemia, the other, resembling pernicious anemia in its blood findings. Until very recently, most of the studies dealing with the anemias of pregnancy focused their attention upon the latter group, which occurs but rarely. This type is usually amenable to treatment only by blood transfusion. It will not be further considered in this discussion, as in our series we did not meet with a single typical case of this group.

The exact etiology of the secondary anemia has not been definitely established. Various causes have been assigned as possible etiologic factors, but no one of them has as yet gained a clear title to this distinction. For example, overdestruction of the red blood cells in the placenta by various hemolysins with abstraction of the iron by the fetus, deficiency of replacement of these destroyed cells by the blood-forming organs, hydremia, foci of infection, a preceding anemia, vitamin deficiency—all have been accused as etiologic agents. Some proof has been advanced for all of these factors, and it is possible that a combination of several of them may be the final solution.

During the last three or four years, the work of Galloway, Moore, Bland, Weiss, Strauss, and others has helped to bring this problem somewhat to the fore. These investigators have found that forty-seven to sixty-five per cent of pregnant women tend to develop anemia during pregnancy, and that this anemia is progressive. It has also been established that a certain number of these patients recover spontaneously after delivery. It is felt that although a definite etiologic factor is not yet known, nevertheless empirical treatment for the anemia should be undertaken the better to prepare the patient for the hazards of labor and the puerperium. Various substances have been suggested for treatment, with diverse reports as to their value.

Our own study was undertaken in the effort to establish in a series of untreated cases the exact degree of the progress of the anemia during pregnancy. This was accomplished by doing frequent complete blood counts—red cell, white cell, and hemoglobin determinations, and differential counts—on each patient throughout her pregnancy and puerperium. It was also decided to test the value of various preparations in treating another series of patients, and to check the blood findings in exactly the same manner. The patients were all followed in the prenatal clinic of the Robinson Memorial, the blood for examination being taken by three different technicians.* The counts were all performed by one of us, Mrs. Walker, in order to establish uniformity in the results. Two hundred cells were counted for each differential count. The hemoglobin determinations were all performed by the Hayden-Hauser hemoglobinometer. From six to ten counts were taken on most of the patients, counts being done at each visit to the prenatal clinic, and also within twenty-four hours of delivery, and at periods of one week, two weeks, and six weeks postpartum. Sixty-nine patients were in the untreated group, and one hundred and twenty in the treated group. The latter were subdivided into six sub-groups of twenty each, each group receiving a different preparation†. Unfortunately, as will be seen from the tables below, thirty-one of the treated patients could not be followed throughout, because they either left the clinic or refused to continue with the medication.

We classed as anemic all patients whose blood findings fell below the criteria accepted as the lowest limits of the normal, namely, a hemoglobin of seventy per cent and a red cell count of three and one-half million. Thus, we discovered that forty-three per cent of the 161 patients tested had a secondary anemia. If, however, we also included a borderline group which had a hemoglobin percentage between seventy and seventy-seven, red cell counts between three and one-half and four million, and the signs of secondary anemia in the smear, our percentage of such patients rose to fifty-six per cent. It is particularly interesting to note that the percentage of anemic patients changed very markedly with the seasonal variation of the year. Of the 161 cases, examined in the late summer and early fall, 43 per cent showed an anemia. These formed the untreated control group. Our treated cases, selected in February and March, were chosen from a group of 133 patients of whom ninety per cent had anemia.‡

Table I below shows the average counts in the untreated anemic cases throughout the period in which they were followed.

It is thus seen that in untreated cases, the anemia is progressive, and that there is a moderate spontaneous recovery during the lying-in period. We did not find any diminution in the anemia in the two-week period preceding term, as has been suggested by some authors. We did, however, find a definite increase in the anemia at the examination at the sixth week postpartum.

*We wish to express our thanks to Dr. F. L. Belding for his coöperation in permitting the Misses Hinckley and Bland and Mrs. Stewart from his laboratory to take these counts for us. We also wish to thank the latter for their aid and interest in this work.

†We wish to thank the various companies that so graciously furnished us with all the necessary material for carrying out this study. The Myeladol was furnished by the Upjohn Company, the Neobovinine-29 by the Bovinine Company, the iron, manganese, and copper tablet by the G. D. Searle Company, the liver and iron by Eli Lilly Company, and the ventriculin and iron by Parke, Davis & Co.

‡If the borderline cases are also included, the percentage of anemia rises to ninety-five per cent.

The disadvantages incurred by lack of treatment were no doubt aggravated by the inability of the patients to afford proper food and help at home on returning from the hospital. The resultant extra work demanded from the weakened patient, thus definitely retarded her recovery.

in respect to the maintenance and increase of the hemoglobin and red blood cells in comparison with the condition of the patients before treatment began was ventriculin and iron, and the second in rank was liver and iron.

Table VIII illustrates a comparison of certain

TABLE I

AVERAGES OF BLOOD FINDINGS IN THE UNTREATED ANEMIA CASES*

	Hgb.	Rbc	C. I.	Wbc	PMN	Lym	End	Eos	Bas
Second Trimester	64.9	353.3	0.93	9,590	74.9	19.9	4.1	0.77	0.23
Third Trimester	62.8	345.5	0.96	9,992	72.5	20.8	6.11	0.72	0.18
First 24 hours postpartum	64.3	368.5	0.86	13,729	77.4	16.7	5.3	0.57	0.16
First week postpartum	66.1	376.3	0.87	10,996	71	21.4	6.1	1.3	0.3
Second week postpartum	68.9	389.8	0.88	9,931	70	23.6	5.25	1.33	0.2
Sixth week postpartum	68.7	378.5	0.91	6,940	56.1	35.2	8.96	1.5	0.4

*The number of cases in the First Trimester was too small to give a fair average.

Tables II to VII inclusive deal with the treated cases. In this group we also included those so-called borderline cases which had low hemoglobin percentages and smears showing secondary anemia, but which had red cell counts of between three and one-half and four million. These tables are practically self-explanatory and need but little additional interpretation.

interesting factors between all the untreated cases and the treated cases. The percentage of primiparae and multiparae in both groups is practically identical so that the comparison is thus more accurate from this point of view.* In the untreated cases, there were double the number with elevated blood pressure, most of whom were of the pre-eclamptic type,

TABLE II

AVERAGES OF BLOOD FINDINGS IN TREATED CASES BEFORE BEGINNING OF TREATMENT*

Groups According to Medication to Be Given	Hgb.	Rbc	C. I.	Wbc	PMN	Lym	End	Eos	Bas	No. Cases
Myeladol†	66.3	389.1	0.84	10,418	73.9	18	7.3	0.66	0.08	12
Neobovinine-20‡	71.7	380.1	0.95	10,303	71.7	17.5	9.4	1.19	0.29	13
Iron, Copper, Manganese, Calcium	67.1	366.6	0.92	9,876	70.7	20.8	7.5	0.85	0.10	17
Blaud's with Arsenic and Strychnine	64.1	395.1	0.80	11,644	74.8	17.6	6.9	0.33	0.33	11
Liver and Iron	68	395.5	0.85	10,540	73.9	19.3	6.3	0.35	0.15	18
Ventriculin and Iron	66.6	378.1	0.89	10,000	73	18.4	7.9	0.70	0.04	18

*The dosage of these substances was as follows:
Myeladol—one tablespoonful t. i. d.
Neobovinine-20—one tablespoonful t. i. d.
Iron, Copper, Manganese, Calcium—2 tablets t. i. d.
Blaud's with Arsenic and Strychnine—2 tablets t. i. d.
Liver and Iron—one teaspoonful t. i. d.
Ventriculin and Iron—10 to 20 grams daily.

†Each fluid ounce contains

Super D cod liver oil (Upjohn)	120 minims
Glycerinated Extract Red Bone Marrow	10 "
Iron and Ammonium Citrate	4 grains
Malt extract	qs

‡"An original organic compound of liver extract and beef hemoglobin." Each tablespoonful contains the equivalent of 0.83 ounces of fresh whole liver.

The tables show that treatment definitely stops the downward curve during the second and third trimesters, particularly by raising the hemoglobin percentage. The recovery after delivery is more rapid, also, being somewhat more evident in the percentage of hemoglobin than in the red cell count, although the latter also is raised. It must not be forgotten that this improvement is evident despite the fact that the economic circumstances of these patients do not permit them the best possible care for their condition. The white blood cell count and the percentage of polymorphonuclear cells rise definitely during labor and remain high for the first few days after delivery, gradually returning to normal by the second week postpartum. As for the relative value of the various preparations used in this study, the tables again indicate clearly the results. The best preparation

and there were almost five times as many premature deliveries. These two factors probably account for the increased fetal mortality in the untreated cases. Labor was definitely longer in the untreated cases. Probably the most important difference between the two groups was the higher percentage of morbidity†, — in the untreated group, 27.9 per cent as against 11.2 per cent in the treated group. These are the infections which are so dangerous to the future health of the mother, and anything which will help to prevent them is certainly of great value in the care of the patient. We do not mean to imply by table VIII that anemia is the cause for the differences indicated therein. It

	Untreated (69 Cases)	Treated (89 Cases)
*Primiparae	32.2%	31.5%
Multiparae	67.8%	68.5%

†The criterion for morbidity was a rise in temperature for 24 hours to 100.4 F. or over.

TABLE III

EFFECT OF TREATMENT DURING THE SECOND TRIMESTER

Groups According to Medication Given	Hgb.	Rbc	C. I.	Wbc	PMN	Lym	End	Eos	Bas	No. Cases
Myeladol	68	343	1.00	9,582	71.5	20.4	7.6	0.92	0.25	12
Neobovinine-20	69.8	360.9	0.97	10,277	72.4	18.5	8.3	1.1	0.3	13
Iron, Copper, Manganese, Calcium	71.6	359.7	0.99	9,587	70.9	19.9	7.8	1.1	0.18	17
Blaud's with Arsenic and Strychnine	72.4	377.1	0.96	11,364	70.6	12.4	10.7	0.8	0.16	11
Liver and Iron	70	370.2	0.94	9,772	73.1	17.3	6.3	1.1	0.11	18
Ventriculin and Iron	71.2	371.6	0.96	9,500	74.1	18.8	6.8	0.73	0.11	18
Untreated Cases	62.8	345.5	0.96	9,992	72.5	20.8	4.1	0.77	0.4	69

TABLE IV

EFFECT OF TREATMENT DURING THE THIRD TRIMESTER

Groups According to Medication Given	Hgb.	Rbc	C. I.	Wbc	PMN	Lym	End	Eos	Bas	No. Cases
Myeladol	68.3	347.3	0.99	10,740	72.6	20.9	4.6	1.1	0.14	12
Neobovinine-20	75.5	381.3	0.99	14,645	78.6	16.3	6.5	0.1	0.05	13
Iron, Copper, Manganese, Calcium	73.2	380.8	0.96	14,150	78	18.8	5.3	0.6	0.75	17
Blaud's with Arsenic and Strychnine	73.2	416.5	0.88	16,200	79.4	12.4	7.8	0.3	8.18	11
Liver and Iron	70	387.5	0.91	18,661	83.1	11.6	4	0.5	0.13	18
Ventriculin and Iron	74	386.4	0.96	13,930	76.5	17.4	5.1	0.7	0.20	18
Untreated Cases	64.3	368.5	0.86	13,724	77.9	16.7	5.3	0.57	0.16	69

TABLE V

EFFECT OF TREATMENT THE FIRST WEEK POSTPARTUM

Groups According to Medication Given	Hgb.	Rbc	C. I.	Wbc	PMN	Lym	End	Eos	Bas	No. Cases
Myeladol	72	365.4	0.94	9,485	69.3	24.1	5.3	1.1	0.33	12
Neobovinine-20	76	401.3	0.95	10,766	69.7	17.3	6.7	1.2	0.20	13
Iron, Copper, Manganese, Calcium	76.5	386.6	0.99	10,133	67	24.6	8.2	1.5	0.23	17
Blaud's with Arsenic and Strychnine	76.3	398.5	0.96	9,188	69.9	21.7	8.1	1	0.32	11
Liver and Iron	71.3	387	0.92	11,186	72.2	20.7	5	1.7	0.25	18
Ventriculin and Iron	75.9	392.7	0.97	9,225	64.8	26	6	1.4	0.28	18
Untreated Cases	66.1	376.3	0.87	10,996	71	21.4	6.1	1.3	0.3	69

TABLE VI

EFFECT OF TREATMENT THE SECOND WEEK POSTPARTUM

Groups According to Medication Given	Hgb.	Rbc	C. I.	Wbc	PMN	Lym	End	Eos	Bas	No. Cases
Myeladol	76	382.6	0.99	8,133	54.1	27.7	2.9	1.1	0.13	12
Neobovinine-20	76	402.4	0.95	9,583	64.7	22	6.9	1.9	0.40	13
Iron, Copper, Manganese, Calcium	76.5	392	0.99	8,321	63.9	29.4	6.8	2.1	0.32	17
Blaud's with Arsenic and Strychnine	75.8	384.4	0.99	9,233	67.3	25.7	7.4	1	0.06	11
Liver and Iron	71.4	409.7	0.88	10,992	68.5	25.1	4.4	1.7	0.27	18
Ventriculin and Iron	77.2	384.3	0.90	8,991	60.3	30.7	7.3	2	0.09	18
Untreated Cases	68.9	378.5	0.98	9,940	70	23.6	5.25	1.33	0.2	69

TABLE VII

EFFECT OF TREATMENT THE SIXTH WEEK POSTPARTUM

Groups According to Medication Given	Hgb.	Rbc	C. I.	Wbc	PMN	Lym	End	Eos	Bas	No. Cases
Myeladol	72.6	400	0.91	10,360	62.2	30.3	5.7	1.3	0.17	4
Neobovinine-20	72	379	0.96	6,875	57.9	39.5	5.7	2	0.40	4
Iron, Copper, Manganese, Calcium	76.5	390.3	0.99	8,862	60.3	31.1	4.1	3.5	0.19	8
Blaud's with Arsenic and Strychnine	76.2	394.4	0.96	8,540	60.9	36.8	8	3	0.25	5
Liver and Iron	71.8	392.1	0.92	8,650	55.2	37.8	5.4	1.1	0.57	6
Ventriculin and Iron	75.2	386.3	0.97	9,133	58.6	33	5.8	2.5	0.35	10
Untreated Cases	68.7	378.5	0.91	6,940	56.1	35.2	8.96	1.5	0.4	29

is known that a patient with lowered resistance is more liable to unfavorable complications during pregnancy, labor, and the puerperium. Therefore, it is fair to assume that any condition which tends to lower the patient's resistance may be considered an aggravating factor of such complications. And since anemia definitely lowers the patient's resistance, it must be included under the head of such aggravating factors.

TABLE VIII

COMPARISON OF VARIOUS FACTORS IN THE TREATED AND THE UNTREATED CASES

	Untreated (69 Cases)	Treated (89 Cases)
Cases with systolic pressure above 140	4.9%	2.2%
Cases with systolic pressure below 100	48.9%	42.6%
Premature deliveries	4.9%	1.1%
Average length of labor:		
Primiparae	22.8 hrs.	15.6 hrs.
Multiparae	13.4 hrs.	11.1 hrs.
Morbidity during puerperium	27.9%	11.2%
Maternal mortality	1.9%	0
Fetal mortality:		
Premature	2.5%	1.1%
Full term (alive)	1.9%	1.1%
Stillborn (full term)	2.5%	1.1%
Average weight of babies	7.4 lbs.	7.6 lbs.

SUMMARY

1) Approximately 64 per cent of pregnant women develop anemia. This high average is the result of including the high percentage of anemic patients found in the late winter months. If this latter group be omitted from the average, the per cent of patients with anemia falls to 43.

2) This anemia is progressive and is followed by a moderate spontaneous recovery after delivery.

3) Treatment improved the anemic condition, and made possible a more speedy recovery after delivery.

4) Routine examination of all pregnant patients for anemia is thus definitely indicated, and appropriate treatment should be administered.

5) The relative success with various products in the treatment of these cases is shown.

6) There were more premature deliveries, a greater number of toxemias, a higher fetal mortality, a higher morbidity, and a longer labor in the untreated cases. We are not yet prepared to say positively what influence anemia and its treatment have upon these conditions.

BRONCHOSCOPY IN THE TREATMENT OF PULMONARY ABSCESS AND BRONCHIECTASIS*

BY LOUIS H. CLERF, M.D.†

BEFORE proceeding with bronchoscopy in the treatment of pulmonary abscess and bronchiectasis, one must bear in mind that its value is not entirely dependent on mechanical aspiration of pus. While drainage, considered in its broadest sense, is the most important part in treatment, a knowledge of etiological factors and other data is imperative to intelligently outline a plan of treatment. Bronchoscopy is helpful and in certain instances it is indispensable in securing this information.

Practically all the patients sent to the Bronchoscopic Clinic for treatment had been previously under medical observation for variable periods of time. Roentgen examination, repeated sputum studies and other necessary diagnostic procedures had been carried out. One would therefore assume that a diagnosis of pulmonary abscess or bronchiectasis could be accepted and bronchoscopic aspiration instituted to supplement the general medical treatment. Experience, however, has shown that a diagnostic bronchoscopy is often indicated before arriving at final conclusions. A certain number of cases of pulmonary abscess involving a lower lobe, suggesting that they were nontuberculous in origin, have been diagnosed as tuberculosis on the basis of finding tubercle bacilli in the bronchoscopically removed secretion although repeated sputum studies had previously been negative. For that reason it is important to secure certain data before proceeding with a preconceived plan of treatment.

Pulmonary abscess.—In our experience at the Bronchoscopic Clinic a history of surgical operation about the throat or mouth commonly performed under general anesthesia was elicited in over 60 per cent of the cases of pulmonary ab-

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scess. In addition, a majority of the abscesses were monolobar and more than 50 per cent involved an upper lobe. This should suggest the possibility of aspiration as an etiological factor and should also indicate the need of ruling out a bronchial foreign body. Curiously, demonstrable foreign bodies in the bronchus are not commonly complicated by the development of abscess. The distinction *demonstrable* is used to distinguish these foreign bodies from microscopic particles of material which I believe can very readily be aspirated and ultimately set up a localized pneumonitis, often the forerunner of abscess or of bronchiectasis. This belief is further substantiated by the excellent results often secured by prompt bronchoscopic aspiration in pulmonary complications developing within a week or ten days after tonsillectomy, tooth extraction or other surgical procedure about the mouth or throat.

Bronchial neoplasms are occasionally complicated by pulmonary abscess particularly during the latter stages of the disease. It often is a terminal complication. In a certain number, however, the symptoms and clinical findings are typical of pulmonary abscess. Practically every thoracic surgeon has had the experience of operating on a case of pulmonary abscess which later was found to be secondary to cancer of the bronchus. Primary cancer of the bronchus commonly involves the larger bronchi and is therefore accessible to bronchoscopic inspection and biopsy. Although less frequent in occurrence, benign neoplasms, broncholiths and other forms of bronchial obstruction must be considered and should be ruled out by bronchoscopy. It would therefore seem advisable when planning the treatment of pulmonary abscess to secure all possible data concerning the etiology as well as the condition of the involved lung. This can best be obtained by close coöperation of the internist and roentgenologist with the bronchoscopist and surgeon.

In the treatment of pulmonary abscess communicating with a bronchus, success is dependent on adequate drainage. Among the important factors influencing drainage are location of the abscess, presence of mechanical obstructions, as granulation tissue or inflamed mucosa, and efficiency of cilia and cough. Posture, general medical measures and the exclusion of sedative mixtures will aid in improving drainage. Endobronchial obstructions must be removed mechanically. The decision to carry out a conservative plan of treatment without or with bronchoscopy or to resort to external surgical drainage should be arrived at by consultation. The patient who presents no clinical or roentgen evidences of retention of pus requires but conservative medical care. If there is fever with clinical and roentgen evidences of inadequate drainage, measures designed to improve this are indicated. Mechanical obstruction to drainage may result from granulation tissue, inflamed mucosa and inspissated pus, or ciliary activity and cough may be impaired by the physical characters or the quantity of pus. These conditions can be remedied bronchoscopically.

How long should bronchoscopy be continued? In a procedure of this character there can be no rule applied as to the number of aspirations or the duration of the period of treatment. The progress of the disease as recorded by frequent roentgen examinations, the bronchoscopic findings, clinical observations and the quantity of pus expectorated, must be the determining factors. If there is no improvement in the physical signs or symptoms following several bronchoscopic treatments it does not necessarily follow that bronchoscopy should be discontinued. Often fever will persist and the physical signs remain unchanged for several weeks; the roentgen findings, however, may exhibit definite improvement. The clinical course of the disease should be the determining factor in a decision whether bronchoscopy should be continued or whether surgery should be resorted to. For that reason it is important to correlate all available data in arriving at conclusions. This can be accomplished only by close coöperation. It has been the custom at the bronchoscopic clinic to have weekly conferences between the internist, roentgenologist, bronchoscopist and surgeon for consideration of these cases.

Bronchiectasis presents innumerable difficulties both from the standpoint of diagnosis and treatment. I am convinced that the medical profession, as a whole, does not fully appreciate the serious nature of bronchiectasis. It is remarkable to note that there is little in the medical literature regarding the prognosis in these cases. It should be considered as a progressive disease in a majority of cases. It should also be noted that fatal complications and sequelae are not uncommonly observed in patients with bronchiectasis. In my experience there is no pulmonary lesion that presents the problems in diagnosis that are met with in suspected or early cases of bronchiectasis. This observation is made on the basis of reports received from a large number of competent physicians who have sent patients to the Bronchoscopic Clinic either for verification of a diagnosis or for treatment of bronchiectasis. It is, first of all, necessary to ascertain if bronchiectasis is present. If present, one should ascertain the extent of involvement, particularly if unilateral or bilateral. If unilateral, one should learn if one or more lobes are involved. It is also imperative to ascertain the presence or absence of obstruction. While much of this information can be secured by physical examination and roentgen study no thoracic surgeon would contemplate surgical treatment solely on these findings. It must be recalled that nontuberculous bronchiectasis usually involves lower lobe bronchi. It commonly

begins in the smaller bronchi; changes in the large bronchi are observed only in advanced cases. Cases of obstructive bronchiectasis are more often unilateral; bronchiectasis associated with suppuration of the nasal accessory sinuses is commonly bilateral.

The instillation of iodized oil has contributed more than any one factor in aiding the roentgenologist in the diagnosis of suspected cases of bronchiectasis. The method of instillation must be left to the discretion of the examiner. In order to be effective the oil must be delivered to that portion of the bronchial tree to be examined. The bronchoscopic method possesses obvious advantages over all others in that it permits of accurate placement of the iodized oil and also aids in securing data that can be obtained only by direct inspection of the interior of the larger bronchi. In all cases of obstructive bronchiectasis, final conclusions cannot be arrived at without diagnostic bronchoscopy.

The *treatment* of bronchiectasis is dependent on certain data acquired in the diagnostic studies. The best results by bronchoscopy are obtained in certain of the obstructive forms. In many of these the obstruction to the bronchus can be relieved bronchoscopically and aeration and drainage reëstablished. It is a recognized fact that the structural changes in the walls of a dilated bronchus as well as in the peribronchial tissues cannot be materially altered by treatment. The dilatation is permanent and tends to increase, depending on the extent of the fibrotic changes. Measures directed toward improving drainage, preventing stagnation and building up the patient's bodily resistance are palliative and must be continued indefinitely to maintain the relief obtained. Postural drainage, bronchoscopy and certain conservative surgical procedures fall in this group. One of the advantages of bronchoscopy is that secretions are more effectively removed; unfortunately, however, it cannot be practiced as often as postural drainage.

In the present state of our knowledge the only plan of treatment for a cure of bronchiectasis is surgical extirpation. This is practiced in unilateral cases although successes have been reported in those with bilateral involvement. The nonsurgical treatment consists of palliative measures, namely posture, bronchoscopy, bronchial irrigation, intratracheal medication, vaccine therapy, general hygienic care and removal of foci of infection in the upper air passages, e.g., diseased tonsils, and nasal sinus disease. In a certain number excellent results have been secured by these measures. This has been particularly noticeable in children. It has been frequently observed, however, that symptoms often recur following an acute upper respiratory infection with bronchial extension. It is believed that the greatest field of usefulness in the conservative treatment of bronchiectasis lies in treating the young.

The treatment of bronchiectasis, is, generally speaking, very unsatisfactory. A small group can be successfully treated by surgical means. A majority of the cases can hope for temporary benefit secured by palliative measures. Measures for the prevention of bronchiectasis should receive more attention. Prompt recognition and appropriate treatment of bronchial obstruction, so-called unresolved pneumonia, postoperative pulmonary complications, pneumonitis complicating acute infections, and nasal sinus infections associated with tracheobronchial symptoms will be productive of more benefit than all of our efforts to restore to normal function a dilated, tortuous, fibrous-walled bronchus surrounded by fibrous tissue.

A STUDY OF TEN YEARS' WORK AT THE PRENDERGAST PREVENTORIUM OF THE BOSTON TUBERCULOSIS ASSOCIATION

BY JOHN B. HAWES, 2ND, M.D.,* NATHANIEL K. WOOD, M.D.,* AND DONALD S. KING, M.D.*

FOR the past eleven years the Boston Tuberculosis Association has maintained a preventorium for children from the city of Boston who have been exposed to tuberculosis. As the city itself makes no provision for such children, this Association determined to meet this need, in part, at least. The cost of maintenance is a large part of our annual budget and is raised from private sources without help from city or state. As doubts have been expressed as to the wisdom of continuing this work, which in terms of dollars and cents is a large liability, we have made the following study to ascertain from the present condition of the children who attended the Preventorium during the past decade, whether the time, strength and money spent were sufficiently justified by the results obtained and should be continued.

The Prendergast Preventorium consists of a well-equipped and homelike main building which includes dormitories for sixty boys and girls together with separate buildings, including a schoolroom, workshop, sleeping pavilions as well as a swimming pool, all located on a tract of sixteen acres of land on the outskirts of Boston. The requirements for admission are that

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each child shall be between seven and twelve years of age and must show definite contact with an open case of tuberculosis and have a positive von Pirquet reaction. In a few instances an intelligence test is required. There are no restrictions as to race, creed or color. The majority of these children are referred by the city tuberculosis clinics; a few come from other health or social agencies and a very few from private physicians. In what we call our "permanent beds" we have an average population of 35-40 children, the exact number depending on our budget, and during the two summer months we take in 75-100 more. The average length of stay of the resident children was 237 days and that of the summer camp children 67 days.

During the past ten years, including 34 children at the Preventorium on May 1, 1933, we have cared for 899 boys and girls. Of these 194 have been ruled out because of their short length of stay, leaving 705 children, 671 discharged and 34 in residence who form the basis of this study. There were 315 boys and 390 girls. Of the total number, 404 had been permanent residents and 301 members of the summer camp. All these children were born in this country but their parentage was widely diversified, 320 American, 121 Irish, 98 Italian, 36 Canadian, 27 Polish, among others. Of the 404 resident children, 57 had been admitted once, 14 twice, while one child had been admitted five times! Likewise, of the summer camp children, 53 had been re-admitted once and seven returned to the camp four times. This question of the re-admission of children to the Preventorium is a difficult and yet an important one to decide. On the whole, although the argument that the greatest good to the greatest number has its merits, we feel that it is better to try to do an intensive piece of work with fewer children than a poorer and inadequate job with many. Our records show that the benefits of re-admission are very definite and real, affecting not only the child but his parents and family. In many cases so extreme was the economic situation at home, that the temporary relief from responsibility of the child was of inestimable help to the tired, sick and discouraged parents. In addition, such re-admission brought about a much closer relation between our follow-up nurse and the child's family making possible improvements in the home situation that could not have been accomplished otherwise. We feel, therefore, that poor physical condition on the part of the child and an inadequate income at home are sufficient reasons for re-admission not only once but oftener if necessary to do a complete piece of work.

The physical condition of these 705 children on admission showed wide variations but all showed by x-ray definite evidence of tuberculous infection. Two hundred and twenty-nine were manifestly in excellent condition in every way, 292, while well-developed, showed some signs of being undernourished; 91 were below par both in development and nourishment, while 68 were distinctly poorly developed and nourished. On discharge, with the exception of a very small group who went home against advice or who were discharged for the infraction of rules, all showed definite improvement, a point well confirmed by subsequent x-rays. Likewise, our records show that 90 per cent of the children who attended the Preventorium school were promoted, including a large number who had not done well in public schools prior to their admission. It was gratifying to note how rest, good food and fresh air along with new and attractive surroundings, individual attention, kindness and patience, awakened in the child an active interest to study and to learn.

An important and indeed an essential part of preventorium work is done after the child has left the institution. This consists in seeing that each child is under adequate medical supervision and is not lost sight of after discharge. This is done through an after-care worker, in our case a nurse highly trained in this field. She visits each child in the home, sees that it reports regularly to the clinic or elsewhere for examination, and, of far greater importance, she obtains the coöperation of parents and other members of the family so that the training received at the Preventorium is not dropped. One of her duties, a most difficult and yet vital one, is to see that the original source of the child's infection is either eliminated altogether or reduced to a minimum, a difficult but not an impossible task. The thoroughness and efficiency of our own after-care worker in this regard are shown by the fact that during this eleven-year period, out of 705 children only 29 cannot be traced, while only one has been known to have since died of tuberculosis. Nineteen children were admitted to sanatoria after leaving our Preventorium not because of the development of active tuberculosis but in the case of some as a preventive measure, beds in our own institution not being available, or with others because they had passed our age limit. At present, all but four of these have returned to their homes and to school in good condition. Two children out of 705 have since developed pulmonary tuberculosis and have had active sanatorium treatment. The following is the story of one of these:

This girl, twelve years old, was admitted to our Preventorium in very poor condition and remained 296 days, gaining twenty-two and a half pounds. After her discharge, she was admitted to a sanatorium day school near her home which she attended for three years. In

addition to this she helped take care of an aunt, an active case of tuberculosis, as well as her mother who could not be persuaded to go to a sanatorium but who insisted on remaining at home, a constant source of infection. At the end of her third year in school, this girl was likewise found to have active tuberculosis and was admitted to a sanatorium where she remained for four years. In the meantime the aunt had died and the mother was finally taken to an institution. On her discharge, the girl was again referred to us and was at once admitted to our Sheltered Workshop where she has now been working three hours a day under close medical supervision for the past year and a half. At present she is in good physical condition in every way with her disease apparently arrested.

Constant and long-continued medical supervision as exemplified in this girl's case is essential to good results. Out of the total number of children included in this study 435 were found to be under good medical supervision; in 170 this was only fair, and in thirty-one it was inadequate or lacking. This group was made up of boys and girls in late "teen" age who flatly refused to go to a clinic or to consult a physician. Each appeared to be in good condition, however.

During the past year, 362 of the 636 children who had been discharged were x-rayed. Out of these, seventy suspicious cases were found, each of whom was given a careful physical examination. Of these children fifty-nine were in good condition, nine in only fair condition, while one child proved to have scoliosis and one a congenital heart. No child was found to have active tuberculosis. This group of seventy children will be watched with the greatest care.

The school records of the children discharged from our Preventorium show that up to May 1, 1933, 106 have completed high school, 158 are in high school at present, 314 are in grammar school and eighty-two left school when old enough to work. Of the 106 who graduated from high school and the eighty-two who left school, ninety-two were at work in the following fields: clerks, sales ladies, nurses, business college, doctor's assistant, chauffeur, electricians, salesmen, factory workers, companion, stenographer, mechanic, tailors, priest, nun, counsellor, maids. Five have married.

An important point in a study of this kind is to find out what has happened to those tuberculous individuals who were the original source of the infection from which these children contracted their disease. It was found that a large number of these, 65 per cent, had died previous to the child's admission to the Preventorium, and in many cases it was this that led to the discovery of the infected child. In 267 cases the source of infection had received sanatorium care. In this group precautions to prevent further infection were fairly well carried out in the home. We were firmly convinced that our greatest problem would be with a group of 109 men and women who had received no sanatorium care, and yet much to our surprise the children coming from such homes were found to be in just about as good condition as those in other groups who had had no such prolonged exposure. We believe that it is fair to assume that this is largely due to the work of our follow-up nurse and her ability to bring about intelligent coöperation on the part of the family. This particular group is largely made up of the foreign element who do not understand the dangers of infection. It may very well be that by taking the child from such a home, opportunity for closer coöperation between the family and the nurse was given which could not have been brought about in any other way. In such families as these, slowly but surely the nurse gains the mother's confidence long before the child is discharged from the Preventorium. Then when the child finally returns home the basis for future work is laid. Then the nurse plans the child's daily routine, takes him to the clinic when necessary, helps to get aid from the city or elsewhere if needed, and arranges with clubs and settlement houses for special recreational and educational advantages. Likewise, besides her work with the individual child and family, she enlarges its scope to develop group activities for adults in these homes, such as cooking and sewing classes, family conferences, parents' meetings where talks on child care and hygiene and other topics are discussed. All this is initiated by the after-care nurse.

The following report is a typical example of the time and thought spent on one family in this way in order to safeguard the health of one Preventorium child:

A nine-year-old boy, pale, thin and sickly, was admitted to Prendergast and remained 120 days and was then discharged in good condition. In the meantime his father had died of tuberculosis so that the mother had had to break up her home and live with her parents, resulting in a thoroughly bad home situation. A small apartment was found for mother and son; the mother was well enough to go out to work and the boy, profiting by the lessons learned at the Preventorium, washed the breakfast dishes, swept the floors and made the beds. Through our nurse he attended the nutrition class at school and so had a suitable noon meal each day and after school hours joined a recreation group at a local settlement house which he attended regularly as well as its summer camp. At the present time his physical condition is good and he is examined and x-rayed regularly. His home is cheerful and happy and the future for him is bright.

What may one conclude from this summary of the results of ten years' work with children at our Prendergast Preventorium? Very little,

we fear, that is definite and clear. It will not be until we have made a study of a similar group of children who have been exposed to tuberculosis but who have *not* had any preventorium experience and training and find out what has happened to them, that we can come to any justifiable conclusion as to the value of preventorium work. Certain facts, however, stand out, one especially, that out of 705 children exposed to tuberculosis and infected with that disease, only one child during a ten-year period has died of tuberculosis and only two have developed it in active or clinical form. There is the fact, moreover, intangible but none the less evident, that the standards of living, health and happiness, not only of these children but of their families, have been markedly improved as a result of what these children have learned by example and by teaching at the Preventorium. This alone, we believe, fully justifies the money, energy and time spent on this work. On the whole, as a result of this ten years' study we are confirmed in our belief that the Preventorium is worth while and should be continued and is deserving of liberal support from the medical profession and the public.

THE MANAGEMENT OF INDUSTRIAL ACCIDENTS AFFECTING THE EMPLOYEES OF THE NEW ENGLAND TELEPHONE COMPANY*

BY D. L. LYNCH, M.D.†

MY first desire is to thank your secretary, Dr. William A. Rogers, for his kindness in inviting me to appear before you to-night. I regard it as a very great privilege.

It seemed to me that you might like to see, to look at or look down upon a so-called "Industrial Surgeon" or "Company Doctor", one of a group of probably normal men, much talked about and talked over, generously written up while unfavorably written about, criticized and even maligned, yet quite misunderstood, I am sure. We differ from you only in that our efforts and our services are devoted almost wholly to a special group of working people. We endeavor always to respect the rights and privileges of private practitioners and their patients.

It seemed to me, also, that it might be of interest to you who are particularly concerned with the treatment of accidental injuries to see what results may be achieved in the control of the accident problem in industry when management and workers together attack the problem sincerely and seriously, when the industrial surgeon is a part of the picture and when workmen's compensation laws, industrial accident commissions and other of the usual forms of compensation and insurance and their carriers are not a part of the picture; in other words, when the workers in an industry, executives and workmen together honestly endeavor to control both accidental injuries and compensation.

In order that my paper may be correctly interpreted, I wish to make a few introductory statements.

For many years I have had the honor of being associated, as a physician, with the New England Telephone and Telegraph Company, a part of the Bell System. As surgeons who may have been or who yet may be called upon to care for an injured employee and very likely as holders of the Bell System's securities, you are undoubtedly interested in the affairs and successes of the Company.

The Company operates throughout all of New England except in Connecticut. It employs, on a yearly average, approximately 20,000 men and women. Our Medical Department is concerned in all the accident and health problems of this group of people throughout the territory.

The Company is a so-called self-insurer. Since January 1, 1913, it has maintained a non-contributory plan for employees' pensions, accident and sickness disability benefits and death benefits. In the states where the Industrial Accident Act or Workmen's Compensation Law is not compulsory, as in Massachusetts, the Company cares for its injured employees under this benefit plan. Accident benefits under the plan are greater than compensation under the law. In other states, the Company has been privileged by the various industrial accident commissions to substitute the plan for the act, again because its benefits are the greater.

It is very important in this connection and when viewing our statistics on accident disability and lost time and compensation, to know of the greater benefits under the benefit plan than under the compensation law. There is no maximum payment under the plan. Any employee of the Company disabled by an accident arising out of and in the course of employment is entitled to benefits at the rate of his full pay, whether it be $20.00 or $50.00 or $100 per week from the very first day of such disability for a period of thirteen weeks. That period is usually sufficient to restore the employee to some kind of work. Should disability, however, be

*Read before the Boston Orthopaedic Club, November 13, 1933.

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prolonged, benefits are continued at the rate of one-half the regular pay until disability ceases or death occurs.

One might imagine that accidents and the disability for work due to them would be encouraged and prolonged under such a generous plan of benefits. They are not if properly controlled.

The plan is administered by a committee of five executives of the Company, responsible to the President. The members of the committee are themselves employees of the Company and beneficiaries under the plan when entitled to its benefits. The committee has both legal and medical advice upon its problem. Its decisions, based upon consideration of all evidence, facts, statements, opinions, information and claims pertaining to each case, are made in good faith and are final. Its policy is, I am sure, a very liberal one and in doubtful or borderline cases, the benefit of reasonable doubt favors the employee.

Recitation of a single case will serve as an example of the Company's policy in doubtful cases of accidental injury. A telephone pole broke off at the ground carrying a lineman working upon it to the ground with it. He landed in such a way that he acquired a fracture of the right scapula. He was hospitalized and treated by a competent surgeon and he apparently made an excellent recovery in a reasonable time. He was said to have had no other injury. He was examined for return to work, had recovered practically normal shoulder motion, had no symptoms of illness or disability, but was found to have a cardiac murmur. He was assigned to sedentary work. A month later, he was reëxamined in the routine follow-up, and was observed to have a little dyspnea. Upon inquiry, he admitted some shortness of breath. He was again hospitalized under the care of a very prominent internist. A diagnosis of aortic insufficiency was established. No evidence of vascular disease, or rheumatism, or lues could be detected or found in the history. Lues was reported as the most likely causative factor and the internist declined to say that the accidental injury or the fall could explain the cardiac defect. Medical literature, so far as known, does not support such a theory of cause and effect as seen in this case. Yet the Benefit Committee accepted the presumption that this heart was just at the beginning of systole when the man struck the ground with force sufficient to fracture his scapula and at the same time to damage or even rupture a cusp of his aortic valve with, thereafter, progressive failure until death. Accident disability and death benefits amounting to $7142 and medical expense of $952 were paid by the Company.

It is interesting to recall that, during the last fifteen years at least, and without the protection afforded by the Workmen's Compensation Law and Industrial Accident Commissions, no employee has prosecuted a suit against the Company because of his injury or allegedly unfair treatment. In some instances, as in the State of Maine, hearings have been held in order that the Commission may fix the degree of permanent impairment. No ruling by any commission has been disputed by the Company or held to be unfair.

There have been not more than two cases in fifteen years where allegedly injured employees were obliged to appear in person before the Benefit Committee in an effort to prove their claims. That is evidence of the satisfactory manner in which doubtful claims have been ironed out and disposed of by an understanding, sympathetic and rational discussion of the problem between the employee, his supervisors and the Medical Department before the matter is passed upon by the Benefit Committee.

I mention these facts because they indicate, I think, that the employees as a body, are reasonably well satisfied that the treatment accorded them under the benefit plan is just and fair and liberal.

In order that statistics upon lost time may be properly understood, it should be realized that, especially for men, there is a great variety of jobs at which temporarily and partially disabled men may be productively employed during the period of their lessened capacity and to know that splendid coöperation is extended by the management, by the employment supervisors and by the workmen to the Medical Department in this placement work. In this respect, we are probably favored above those industries wherein the variety of jobs is limited and probably favored over the insurance carrier who is defeated in his effort to restore a convalescent man to work when work would expedite his recovery.

Whatever statistics I may quote upon the results of different methods of surgical treatment of injuries represent only the experience in our Company and should not be interpreted as our opinion upon the efficiency of any particular method of treatment.

We are assured that in so far as management, the employment and other supervisors and the safety organization are aware and can arrange it, all accidental injuries, major and minor, are reported because the way has been made easy.

And finally, bear in mind, please, that the statistics which I will show and quote have been compiled by a statistical department entirely separate and apart from our Medical Department.

Now permit me to show a graph of the accident experience or incidence in the New England Telephone and Telegraph Company during the past ten years.

The chart* is cumulative, month by month for

*Chart I.

each year. Notice the monthly step-up from January to December in 1924. In that year there occurred a total of 583 lost time or totally disabling accidents. Of this number, 454, represented on the chart by the heavy black dots, occurred to workmen in the Plant Department, the men who perform manual work and who encounter real hazards above the ground on poles, ladders and buildings, on the ground in congested streets, in automobiles and trucks, in basements and dark cellars and below the ground in manholes and trenches. The remainder of the total number involved supervisors and office workers, chiefly young women telephone operators.

Note that there has been a progressive, almost steady decline in the number of accidents among both groups of employees during the ten-year period and that for nine months of the current year, the total has dropped to 70, of which only 16, represented by the heavy dots, occurred in the group of nearly 7000 Plant Department men. That represents a decrease of 96.4 per cent in serious accidents among men in the past ten-year period.

I like that chart because it reveals more than a numerical reduction in serious accidents. It visualizes for me the coöperative spirit and effort of management and men to eliminate the pain and the suffering and the anxiety that follow on accidents and to enable these men to return home from work uninjured and unimpaired.

Now it may be imagined or even suggested that the number of accidents declined because the number of men has been reduced during the recent four lean years of depression.

Chart II shows the accident experience upon a ratio or frequency basis. It reveals a consistent drop from 4.43 accidents per 100 men in 1924 to .225 per 100 men during the nine months of this year. And our men have been doing the same manner of work throughout the decade.

Chart III, in its upper section, reveals numerically the accident experience shown graphically in Charts I and II. The asterisks in the last column inform you of the number of men, 21 in all, who were fatally injured or killed in the ten-year period. Some of these deaths were immediate, as by electrocution. Before the others occurred, every possible effort was made

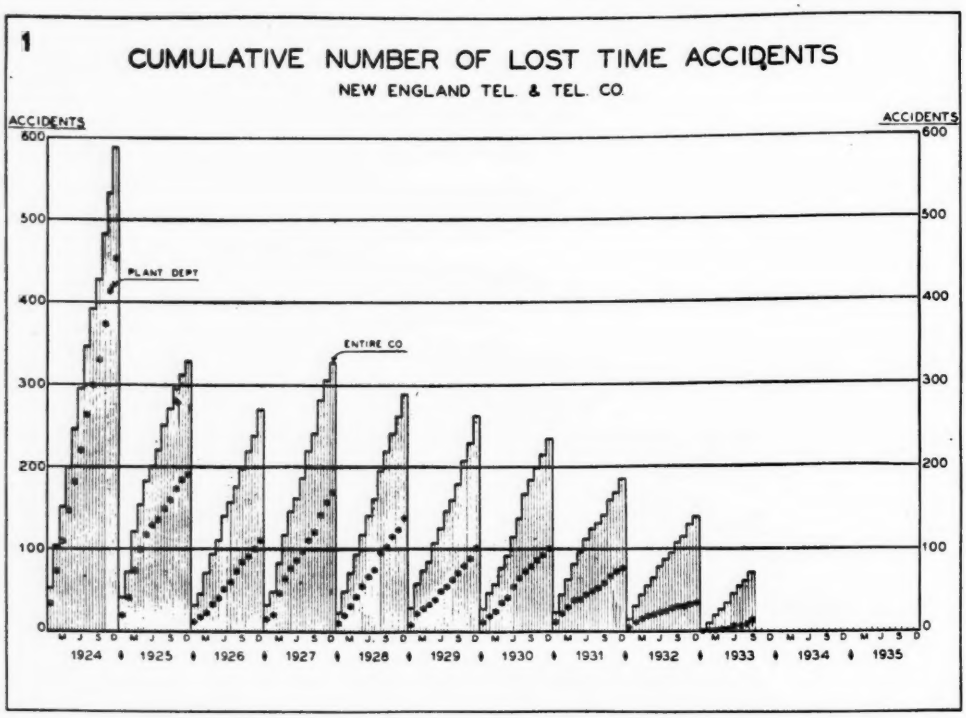

CHART I.

CHART II.

to avoid the death. We regret every one of them. That so many occurred will convince you, I am sure, that the work in which our men are engaged is not altogether free from hazards making for serious accidental injuries.

I am confident that this group of statistics substantiate my previous statement that the would have caused lost time from work. It is not because injured men unfit for work have been required to work, but rather because education, mental hygiene, and pride in their performance have improved the whole attitude of these men toward the problem of accidents. When men who would otherwise lose their pay

NEW ENGLAND TEL. AND TEL. CO. ENTIRE PLANT DEPARTMENT

CUMULATIVE NUMBER OF MONTHLY LOST TIME ACCIDENTS

1924	*34	74	*110	148	181	220	264	299	330	372	414	***454
1925	21	42	74	99	118	*129	135	149	160	174	185	*192
1926	13	18	24	34	41	53	60	74	85	91	101	111
1927	*17	22	47	65	78	*86	*98	112	122	143	158	***170
1928	12	21	*33	44	56	67	*75	96	104	117	124	**139
1929	**10	23	28	34	39	49	55	*63	71	80	89	****103
1930	14	20	26	36	42	*56	66	*74	79	87	93	**101
1931	12	23	30	*38	40	*45	*50	52	60	67	*72	****76
1932	7	12	*16	*18	20	24	25	30	32	32	34	**36
1933	0	2	2	3	4	9	11	14	16			

CUMULATIVE NUMBER OF MONTHLY NO LOST TIME ACCIDENTS

1924	393	649	994	1299	1577	1876	2226	2526	2807	3084	3329	3576
1925	267	469	728	966	1195	1431	1656	1853	2082	2318	2557	2820
1926	295	598	949	1212	1532	1789	2021	2218	2390	2571	2749	2938
1927	192	339	541	688	832	1021	1172	1320	1489	1697	1901	2093
1928	219	427	645	878	1123	1371	1655	1913	2128	2359	2587	2859
1929	274	486	735	989	1294	1572	1869	2102	2344	2611	2808	3030
1930	289	515	794	1042	1302	1577	1803	2036	2259	2453	2627	2823
1931	193	337	535	703	913	1101	1305	1457	1611	1790	1936	2072
1932	154	305	480	619	764	901	1023	1182	1298	1409	1485	1577
1933	84	169	272	387	474	572	640	734	831			

CUMULATIVE NUMBER OF MONTHLY LOST DAYS DUE TO ACCIDENTS

1924	625	1182	2045	2855	3777	4514	5270	6065	6908	7758	8473	9203
1925	648	1148	1737	2242	2674	2928	3197	3501	3786	4110	4452	4849
1926	312	679	1117	1581	2047	2595	3059	3513	4033	4517	4967	5547
1927	483	941	1559	2292	3096	3784	4306	4732	5067	5453	5955	6418
1928	483	859	1373	1805	2176	2513	2814	3140	3476	3799	4040	4221
1929	313	684	1025	1274	1511	1696	1879	2151	2435	2797	3114	3482
1930	427	848	1312	1798	2155	2462	2895	3225	3521	3798	4076	4367
1931	496	960	1365	1779	2146	2479	2736	2953	3137	3358	3603	3918
1932	332	680	1016	1259	1404	1543	1678	1863	2105	2359	2530	2657
1933	104	242	409	507	602	781	982	1211	1347			

*Fatal Cases.

CHART III.

liberal accident disability benefit plan of the Company has not encouraged lost time due to accidents.

I have heard it said that lost time accidents are reduced in number, to some extent at least, because the "hard-boiled industrial surgeon" requires injured men to work who should be at rest at home. That is not so. If it were true and if practically all accidents are properly reported, as I am assured, the number of *no lost time* or minor accidents should be affected, either increased, or stabilized. Let's examine the record.

Section 2 of Chart III reveals that *no lost time* or minor accidents involving Plant Department men have declined from 3576 in 1924 to 831 thus far in 1933. It represents a reduction of 76.5 per cent in the number of minor accidents.

Unquestionably, the count of minor accidents in the recent years includes cases that earlier will report for work in spite of a minor injury acquired at home or at play, lost time from the same or similar injuries acquired at work must stop if the men are as fair and reasonable as telephone men.

Chart III also reveals, in the third section, the number of calendar days lost from work each month and each year by reason of disabling accidents. It shows that the number of such days progressively decreased from 9203 in 1924 to 1347 for nine months of this year, a decrease of 85.4 per cent. And so the trend of lost time has been definitely downward, indicating a decrease in the severity as well as in the number of accidents.

But this tabulation of lost days is deceptive. It does not follow that because there have been only sixteen disabling accidents involving our men and 1347 lost days that the severity rate was eighty-five days. That would indicate severe injuries and prolonged disability. The fact is that

lost days are carried forward from month to month and year to year from the day of each accident as long as its resulting disability continues. Thus the figure of 1347 includes lost days in 1933 by men who were injured in 1932, in 1931 and in 1930.

I regret that there is a feeling prevalent among medical men that we "industrial surgeons" transgress the rights of private physicians by treating many industrial accident injuries. Again, I fear that some surgeons have felt that their work, or what they formerly did for industry, has been lessened or detoured by the company doctor who shunted injured men to his personal or intimate friends.

Of course I can speak only for my department, but I submit that the three charts I have shown make such ideas out to be utterly false. The fact is, as you can plainly see, that the volume of work no longer exists for anybody to do.

If similar conditions prevail in industry generally, I am confident that you will agree that we fellows did not steal your business. It simply isn't there.

It is true, that the "industrial surgeon" has played a part in reducing the number and in minimizing the severity of accidental injuries. But surely he should not be criticized or condemned because he has tried to prevent needless human suffering. You all do that very thing just as often as you can.

The story behind this satisfactory accident experience would take too long for telling. Suffice it now to say that it is the result of teamwork between the management of the Company, the safety and first aid organization, the employment supervisors, the workmen's organization (the International Brotherhood of Telephone Workers), the improved attitude of the workmen themselves toward the problem, and the Medical Department.

The medical contribution consists chiefly,—

1. In the examination of applicants for work wherein an attempt is made to select the proper type of man for the job specified.

2. In follow-up examinations to be assured that newly engaged men have overcome the correctible impairments detected at the pre-employment examination.

3. In a thorough examination, physical, neurological and not infrequently mental of employees who have been injured, followed by a work reassignment of the man whose uncorrectible impaired condition caused or contributed to the accident.

4. In the examination of employees who have been absent from work for seven days for any health reason. Such examinations are, generally speaking, more fruitful than periodic health examinations.

5. In the examination of employees observed or properly suspected by their supervisors or by the safety organization of being careless or in an unsatisfactory health condition.

Such examinations are frequently exhaustive, and may include a test of vision, a neurological check-up, frequently x-ray, and almost always a blood Wassermann. Not infrequently they delve into the social condition to uncover possible psychological causes of accidents.

6. In the periodic reëxamination and encouragement of employees who have been seriously injured until they admit recovery and for an extended period thereafter.

7. In the insistence by the Medical Department, in so far as possible, that the injured employee remain with or under supervision by the doctor who first cared for the injury. Experience indicates that the migratory patient does badly and the variety of opinions and advice that he picks up delay his progress as barnacles slow down a ship.

8. In a policy of definite but sympathetic firmness that an injured employee must return to work within his capacity as soon as he is able, or at once if the injury is not severe, because it is good for his mental health, for his morale and for the morale of his home. This policy of the Medical Department has been made workable by the splendid coöperation of the employment supervisors, who have found ways and means to place such employees, usually productively. It cannot but prevent many neuroses.

9. In the instruction by the safety organization of all male employees in adequate first aid to the injured. The American Red Cross has awarded certificates for first aid to upwards of 7000 men of the Company. Immediate adequate first aid cannot but minimize the severity of many injuries. We have not had in Boston a real septic hand for five years.

10. In what we believe to be prompt and adequate examination and treatment by or under the supervision of our Medical Department for the majority of accidental injuries.

If these practices of industrial medicine have contributed anything toward the reduction in the number and in the severity of accidents, we are glad of it, and we know that it is unjust to censor us even though the volume of work for private practitioners may be lessened.

Chart IV is an illustration upon an employee ratio basis of the yearly reduction in serious and lost time accidents involving both men and women employees during the last decade. It indicates a progressive reduction during that period for men, for women and for the total of the two groups from 2.2 per 100 employees in 1924 to .4 per 100 employees in 1933.

Chart V may be of particular interest to those of you who are especially concerned with compensation. It is my understanding that coverage in industry is based upon the hazards involved and upon a percentage of the payroll. I do not know whether Mr. Parks and Mr. Mars-

ton would consider the percentage of Company payroll in this instance, which includes all compensation paid to injured employees and all expense for treatment high or low. I show it because I think it is interesting. It shows a progressive reduction in accident expense from $85,925 in 1924 to $21,804 this year. In my opinion, it is a favorable showing. It shows a drop in per cent of payroll from 2.6 in 1924 to 1.0 this year.

YEARLY NUMBER OF LOST TIME ACCIDENTS PER 100 EMPLOYEES

NEW ENGLAND TEL. & TEL. CO.

Year	Male Employees	Female Employees	All Employees
1924	4.4	.8	2.2
1925	2.0	.8	1.3
1926	1.3	1.0	1.0
1927	2.2	1.1	1.4
1928	1.8	1.0	1.3
1929	1.3	1.1	1.1
1930	2.0	.9	1.0
1931	.9	.8	.8
1932	.5	.8	.7
1933 (9 mos.)	.2	.5	.4

CHART IV.

ACCIDENT DISABILITY BENEFITS AND TREATMENT EXPENSE

NEW ENGLAND TEL. & TEL. CO.

Year	Disability Benefits	Treatment Expense	Combined Benefits and Expense	
			Amount	% of Payroll
1924	$54,623	$31,302	$85,925	2.6
1925	35,501	29,201	64,702	1.8
1926	33,651	27,752	61,403	1.7
1927	40,053	31,007	71,060	2.1
1928	33,822	25,034	58,856	1.7
1929	27,920	19,958	47,878	1.3
1930	35,951	36,108	72,059	1.9
1931	31,358	29,719	61,077	1.7
1932	23,213	18,875	42,088	1.3
1933 (9 mos.)	14,044	7,760	21,804	1.0

CHART V.

The chart shows something else that is very interesting, that is, treatment expense, or the sums paid to private doctors, dentists, hospitals, nurses, etc., for the treatment of injured employees.

Please note that in one year such expenses exceeded the sum paid to injured employees, that it closely approached it elsewhere and that it has always been relatively high. Please bear in mind that the sum in any year may include an expense incurred in a previous year but delayed in billing and that an average cost based on the yearly number of cases is not justified.

I wish now to lay particular emphasis upon the fact that our Company has no quarrel with doctors' bills that apply to legitimate accidents. I have the privilege of approving these bills for payment, and I have nothing but respect for the fairness with which charges against our Company are made. Seldom is the Company used as a Christmas tree, and I can recall only four medical bills in fifteen years that were disputed. I can recall a greater number where we felt it proper to tell the doctor that he was cheating himself, that the employee's condition and recovery entitled him to a greater fee, and that he could and should increase his charge.

Of course it has happened, and it probably will occur again, that a particular bill cannot be paid by the Company because the Benefit Committee is unable to find that the treated employee's condition was the result of an accident arising out of and in the course of employment. I repeat what I said before, that the policy of the Benefit Committee for the Company is a liberal one but it is not wasteful, nor does it accept extravagant claims. It rejects them. Unfortunately, the doctor concerned in such a case is acquainted only with the patient's story, not with all the facts, and unfortunately, too, feels hurt when the Company fails to pay up.

I am confident that medical charges under the Workmen's Compensation Law would be less annoying to all concerned if all the bills could be passed upon by a medical person able to visualize the character and extent of injury, the type and extent of surgery and treatment involved, to appreciate the purpose of doctors generally to do the right thing, and to realize that peace of mind for the injured person is essential to recovery. Scolding and quarrelling about a medical bill, even a hospital private room fee or an extra visit, does not help the patient to get well.

We realize that our injured fellow workers should have adequate and really good medical service and we feel that they get it. The Company is willing to pay accordingly when the accident is bona fide.

I have in mind a surgeon's bill for $750 for two laparotomies upon an injured employee which we were glad to pay. The man recovered and eventually resumed his regular work.

I have in mind a medical expense of $5966.87 incurred and paid on account of a lineman who alleged that a month before he developed a subpectoral abscess, he acquired a splinter under his thumb-nail while at work.

Chart VI lists a limited number of vertebral body fractures, compression fractures that occurred in a five-year period, and indicates the number of calendar days lost from work in each case. There is a total of ten cases arranged by the number of calendar days lost from work in each case. The average lost time per case was 122.2 days.

All of them were treated conservatively. All of them, except No. 10, were treated either by a member of our medical staff or by a selected orthopedist. The compression fracture in No. 4 was complicated by a serious hypertension; in No. 8 by a fractured os calcis; in No. 7 there were two separate fractures, a cervical and a lumbar; No. 6 had been operated upon for carcinoma of the tongue sixteen months earlier. He did not have a metastasis in the spine, thank

COMPRESSION FRACTURES OF VERTEBRAE

Case No.	Days of Disability	Case No.	Days of Disability
1	38	6	118*
2	92	7	141*
3	93	8	144*
4	110*	9	185
5	116	10	187
	Total days lost from work		1224
	Average days per case		122.4

*Fatal Cases.

CHART VI.

Heaven. He is to-day apparently well. No. 9 was complicated by an annoying deficiency disease, and we purposely delayed his return to work. No. 5 is a man of most peculiar and suspicious make-up, and we were fortunate to return him to work when we did. Otherwise, I am afraid he would be permanently disabled. He remains steadily at work.

In case No. 3, occurring in a distant city, the orthopedist who instituted treatment proposed a fusion. That operation has not recommended itself to us, and we interfered, preventing it. Apparently the man made a good recovery from his accident, now three years past, and returned to work. I saw him a month ago and he is in good condition.

I wish here to thank Dr. William A. Rogers, and also Dr. B. A. Godvin, of our staff, for these results.

I do not wish to imply that these injured men upon their return to work immediately resumed full duty as lineman or cable splicers, or what not. I mean that they returned to gainful occupation, to a daily routine, in an average of 122 days, thus avoiding neuroses, psychoneuroses, defeatism and all the other mental ills that result from prolonged idleness.

It is our policy to decide against line work or the climbing of telephone poles when a man has had a fracture of a vertebral body. Generally, however, these men prefer to return to that work and eventually do so. No. 8, in spite of his fractured vertebra and os calcis, is climbing telephone poles, and No. 7, in spite of two fractures, is climbing telephone poles.

Since January 1, 1932, we have encountered 126 allegedly injured backs without fractures among our Plant men. These injuries resulted from falls, long and short, strains in lifting or pulling, or other exertions, blows from falling or swinging objects, automobile accidents, etc. They include the usual types of muscle and lumbo-sacral and sacro-iliac strains. Many of them were unimportant, some of them were mild, some of them were not injuries in reality, but rather lumbago or other evidences of arthritis and one was of pain due to a large stone in the kidney. Out of this number of 126 allegedly injured men, only three men have lost any time from work, one for forty days, one for nineteen days, and one for twelve days, an average lost time of twenty-four days per case for that group. It is true that a number of these men were temporarily placed upon limited or restricted duty, but they were kept occupied, and I am sure they felt better and were better for it.

We do not suggest that a similar performance is to be expected immediately from all men everywhere reporting back strain. It takes time and example to convince them of the benefit of some form of occupation as good therapeutics; it takes time and patience to mould their psychology favorably, and we doctors must learn from such performances that not every alleged or trivial back strain requires or justifies adhesive strapping and a long rest. If we can do our work in spite of a little backache, our patients should do likewise.

Time did not permit me to tabulate the total number of back injuries to women in the Company since January, 1932. Of course we have many such injuries because telephone girls will slip on waxed floors and trip over their telephone cords and they will fall downstairs.

I have, however, a record of ten, all the back injuries in women that caused lost time since January, 1932. The longest period of absence was twenty-nine days, the shortest one day, and the average fifteen days. They were the usual run of cases and our staff, generally Dr. Godvin, treated most of them.

About three years ago, a young woman who slipped on a tiled floor fell and apparently received a sacro-iliac strain. She had her private physician who notified us that he was through with the case within a month because he believed that she exaggerated her symptoms. We attempted to help her but soon found ourselves defeated when we discovered that she was being advised and controlled by a nurse. We lost patience with her, I am sorry to say. She employed a private surgeon. She had a fusion two and one-half years ago, and she has made no progress whatever toward recovery of working ability. She still complains of pain in the back. I repeat that the operation of fusion has not recommended itself to us.

May I now show you on the last chart, No.

VII, the result of treatment in nine accidental injuries resulting in fractured ossa calces. These men fell or jumped from telephone poles or from a staging.

FRACTURES OF THE OS CALCIS

Arthrodesis		Manipulation and Impaction	
Case No.	Days of Disability	Case No.	Days of Disability
1	241	5	114
2	234	6	91
3	325	7	100
4	185	8	144
		9	174
Total days	985	Total days	623
Average per case	246	Average per case	124

CHART VII.

Nos. 1, 2, 3 and 4 were treated privately, either because they reported immediately to a private physician or were removed to a nearby hospital. This group was treated by open operation. The average days lost per case were 246.

Nos. 5, 6, 7, 8 and 9 were similar cases in which we were able to institute or engage treatment. None of them had open operation, rather they had manipulation and impaction under ether. No. 5 had fractured both ossa calces; No. 9 had fractured both ossa calces, both men falling from telephone poles, and No. 8 also had a vertebral compression fracture. The average days per case lost from work in this group were 124.

None of the first group of men have ever been able to return to work as linemen. Four of the second group are climbing and I hope the last one, a fairly recent case, will be able to do so.

Of course, no two fractures may be exactly alike and the same treatment may not be best suited for all cases. But a fractured os calcis is a fractured os calcis and you may take this picture for what it is worth.

It was my feeling that injured backs and fractured heels would interest you. Whether our management of these annoying problems is good or bad as compared with the results obtained by other men, I do not know. I told about them because they are problems; but I do know that no telephone man who had a fracture in his spine or who strained or otherwise injured his back or who broke his heels is permanently disabled for work, or ever was pensioned or fired from work, because of incapacity or of inability to do some work. And with only two exceptions, all telephone men who have ever been injured by reason of an accident arising out of and in the course of employment and who survived, are earning to-day as much as they did before the accident or more. Only one man is perhaps permanently disabled. He was past sixty-two years of age and had Parkinson's disease when he slipped on a stairway without physical or serious injury, but his preëxisting pronounced disability was considered aggravated by the fall. That is liberal treatment of a high order.

Only two women who have been injured within the last twenty years failed to return to work. One of these has been disabled for four years. She is a mental problem. The other is the sacro-iliac case, now absent from work thirty-five months. I hope they, too, will recover working ability.

Such, then, are the results, good or bad, of an experience wherein the problems of industrial accidents are controlled by the industry itself and when education, fair and just treatment have developed coöperation, right thinking and a helpful responsive attitude on the part of the employees of that industry.

ARTIFICIAL LIGAMENTS AT THE KNEE

A Technique

BY FREDERIC JAY COTTON, M.D.,* AND GORDON MACKAY MORRISON, M.D.*

RUPTURES of lateral ligaments or ruptured crucials at the knee have engendered a vast deal of literature.

First, as to the ruptured crucials, the diagnosis is at least difficult, and with even one lateral gone there is enough free play to make the crucials suspected. There is a good deal of reason to feel that with the laterals intact or restored, perhaps ruptured crucials may not be very important. Then, too, any direct attack on the crucials must do some harm and be of doubtful mechanical stabilizing effect.

*Cotton and Morrison—For records and addresses of authors see page 817, issue of April 12, 1934.

Of the indirect methods only Gallie's ingenious use of the gracilis tendon commends itself. There are a number of other schemes mechanically doubtful, seemingly without much record of success. The technique here described is the outcome of a long-cherished conviction that the important item was restoration of laterals, strong enough to hold and so placed as not to lock motion in flexion and extension.

The first case, about twenty years ago, was one of a loose knee following a total dislocation. The patient was a middle-aged man. The suture material was heavy braided silk.* Later, partly

*Under the influence of Professor Dr. Lange we were using silk at that time for everything, for bridging of an interval, expecting repair to convert the silk into a scar tendon. Sooner or later we got back most of this silk.

because of the irritation leading to removal of the silk, there was a good deal of loss of motion though the joint was stable.

The principle of the x-suture deeply placed was made clear, however, and presently we were doing occasional cases with the present technique, using fascial bands. The essential thing about it all is that with one or both laterals gone, satisfactory ligaments may be constructed out of fascia.

To avoid interference with motion the resultant ligament must be attached near the radial center of the curve of the femoral joint surface, seen laterally (see figure) just below the tip of the adductor tubercle, if we are making

an internal lateral ligament and not too far back or front at the tibial attachment. To get strong bony mooring the fascial strip must go deep under a strong bridge of bone rather deep into the cancellous bone. That means two holes and, in order to avoid an undesirable broad ribbon of ligament, it means an x-crossing of the false ligament. The fascia is drawn taut, knotted, and the knot fastened with gut or fine silk sutures. The whole operation, even if both inner and outer sides are operated on, can be done without opening the knee joint. There is no point in opening it.

Motion at three weeks, weight at six, gives results. A convalescent splint will be called for longer than this, because there is, no matter how tight the knot, a slacking up of the ligament. This slack "takes up" with time but is likely to persist for four months or more.

Two cases had poor motion.*

The rest of the not long list recovered satisfactory function though with less than normal range of flexion.

J. M., aged 21, seen October 3, 1929. Was running down the field in a football game when his knee gave way. This was three months before he was examined. He showed unquestioned rupture of the external lateral ligament (including the long lateral) of the right knee, with marked abnormal mobility, unimproved in the three month interval.

Operation was performed at the Boston City Hospital, November 7, 1929. This was the typical insertion of a suture of strong fascia from the thigh, passed under a bridge of cortical bone above and below the joint, and crossed in x pattern and tied as already described.

Recovery was satisfactory, with no trouble after the early part of the year 1930. Has played baseball, tennis, etc. Examined July 11, 1933. He showed full motion of the knee, no abnormal "slack" laterally, and demonstrated that he could squat on his heels, and do the "duck waddle".

There is some risk of mistake as to the diagnosis of ligament rupture, and several cases have been seen which were diagnosed as internal lateral ligament tears in which operation disclosed an intact ligament, but sharp tearing of the stout fascia enclosing the insertion of the vastus internus, and the hamstrings. All did well, but *might* have done well without operation. Oddly enough these cases may show an abnormal lateral mobility of twenty degrees or more.

Case: S. W., aged 30. Seen in consultation at the Boston City Hospital, January 13, 1930. Five days previously he had sustained a compound fracture of the right ankle, an injury to the left brachial plexus and damage to the right knee without gross lesions. Seen again January 21. At that time a gap could be felt in the tissues on the inner side of the knee, abnormal lateral motion persisted, but operation was recommended for tear of the fascia, not the ligament.

Operation at City Hospital, February 4, 1930. Oblique tear in the fascia in front of the hamstrings two inches long. This was sutured. March 17 note: "knee solid, motion returning." As late as the spring of 1933 he was entirely without trace of any of his injuries.

*But both had had *total* knee dislocations, though without much damage.

A CALL FOR HELP

There are four sources of illness, suffering, and annoyance which the Board of Health is trying to eliminate during the summer months for the benefit of our residents. The effectiveness of this work depends largely on the help and coöperation which we receive from our residents. The activities to which we refer are the prevention of fly and mosquito breeding and the destruction of ragweed and poison ivy. The prevention of fly breeding and the destruction of ragweed and poison ivy are considered in detail in special articles in this issue of the *Bulletin*, which our citizens should read in order to learn how they may help in this work.

Mosquito control has been repeatedly discussed in previous issues so we will merely emphasize at this time the fact that mosquitoes breed only in water. Any water that stands for ten days may be a source of mosquito breeding. Hundreds of mosquitoes may emerge from an ordinary tin can which is left around the yard, from a watering pot or pail, and other chance receptacles. The inspectors locate many of these but they cannot get around often enough to keep everyone's place free from standing water, so that we must depend largely on our citizens to prevent mosquito breeding.—*Brookline Health Bulletin.*

MEDICAL PROGRESS

PROGRESS IN ANESTHESIA IN 1933

BY RUSSELL F. SHELDON, M.D.*

AT its 1933 session in Chicago the American Medical Association devoted two days to Anesthesia. An anesthetist, Albert H. Miller, Providence, R. I. was Chairman of the Section on Miscellaneous Topics, and presided at these meetings. In addition, further steps were taken during 1933 toward the national certification of specialists in anesthesia, and more active measures have been taken, both in legislative and medical channels to clarify the status of the physician anesthetist. But most significant of all, at least locally, more serious efforts are being made in the instruction of students in the art and practice of anesthesia. There is particular reference to the changes made in this respect at the Harvard Medical School, and in connection therewith to the appointment of a resident anesthetist at the Massachusetts General Hospital.

Locally, and throughout the country, anesthetists mourn the loss on November 16, of their esteemed confrere, Frank L. Richardson.

The literature of 1933 is as usual prolific, and no attempt at listing all of it will be made. The enthusiasm which accompanied the introduction of barbituric acid derivatives has somewhat abated, though the use of one new product, sodium evipan[1, 2, 3, 4, 5], as a brief intravenous general anesthetic agent has attained considerable publicity. But in general, the barbiturates have proved more useful as preliminary sedatives[6] than as anesthetic agents in themselves. Certain other new ones have been presented[7, 8].

In a similar way the rectal use of tribromethanol is becoming more of a preliminary to inhalation or local methods than for complete anesthesia. Authentic reports on fatal cases following the use of avertin are still scarce[9, 10, 11], though occasional authors, as Evans[12], speak of them as occurring. Barlow[13, 14], has continued his researches to include the study of avertin fluid, as marketed, with amylene hydrate as solvent, and concludes that the presence of amylene hydrate delays the absorption of tribromethanol, and therefore makes it safer. These studies were made on the rat, but are probably applicable to human beings. Koontz and Moulton[15] present an interesting study on the effect of avertin in the treatment of lung edema brought on by chemical irritation, as in gas warfare, or civilian practice as exemplified by the Cleveland disaster. They find it to be of distinct benefit. As a more accurate test than the usual Congo red for the purity of avertin fluid preparatory to use, Ashworth[16], recommends the use of "Universal indicator."

In inhalation anesthesia two new agents have been introduced; divinyl oxide, commercially vinesthine, prepared by Merck, and cyclopropane. The latter is still undergoing tests of its usefulness and application, and has not yet appeared to any great extent in the literature. It is, however, like divinyl oxide, originally a creature of the chemist, a product which in theory ought to be a good anesthetic. The results of intensive clinical application by Waters at Wisconsin will later be available. Its originator is Henderson of Toronto.

Divinyl oxide, put forth by Leake[17], in California, has been tried out in animals and to some extent in human beings[18]. In theory it should be an ideal anesthetic, but in action it approximates chloroform. Its general use is not yet indicated.

Herb[19] maintains her position on the superiority of ethylene for general anesthesia. She reports, as shown by answers to a questionnaire, thirty-nine explosions with seven injuries and five deaths from nitrous oxide, oxygen and ether, and twenty explosions with one injury and five deaths from ethylene; and with mixtures of nitrous oxide and ethylene two deaths. Sise[20] also finds more explosions with nitrous oxide, oxygen and ether than with ethylene. Humidity of the operating-room appears to be the safety factor in the prevention of explosions.

In its report for 1932[21], published in 1933, the Mayo Clinic reports an increase in the use of ether. This trend is, I believe, noticeable in other places.

Spinal anesthesia, despite the crepe-hanging of Lindemulder[22] maintains its popularity, especially for genito-urinary and pelvic work and surgery of the lower extremities. Marvin[23], Kemp[24], Grodinsky[25], and Tovell[26] provide sensible and clear presentations of its scope and usefulness. In nomenclature, neothesin has become metycaine.

The Mayo Clinic[27] finds the use of ampoules of ten per cent solution of procaine more convenient and less expensive than the crystals, the use of which has been discontinued, but elsewhere the crystals maintain their lead. Harpin[28], emphasizes the value of caudal anesthesia in urology; and Dogliotti[29] presents a full description of the peridural technique.

Little new in technique has been brought out,

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but there is definite increased use of the carbon-dioxide filtration method, and for upper abdominal work, administration of volatile anesthetics by the intratracheal route has increased. This of course insures an airway, and to lessen the trauma from metallic pharyngeal airways Guedel[30] has introduced a non-traumatic one made of rubber.

Flagg[31, 32, 33] has kept up his campaign against asphyxial deaths, and urges coöperation of all agencies concerned, fire departments, public service corporations, and above all, the medical profession.

In resuscitation, Wood[36], Killian[34] and Reese[35] proclaim the virtues of coramine and in the use of hydrochloric acid intravenously. MacGilvra[37] has introduced the term palinaesthesia. Further investigation, however, is needed in both these drugs.

In research, the Massachusetts General Hospital[38, 39, 40, 41] has contributed some valuable work under the leadership of Means and Churchill. The physiology of respiration with the open chest and abdomen has received intensive study. At Wisconsin, Orcutt and Waters[42] have shown the diffusibility of nitrous oxide and ethylene through human skin. Further experimental work on spinal has been published from the Mayo Clinic[27, 43, 44] and Co Tui[45] and Hill and Macdonald[46] have continued their studies. The so-called circulation of the cerebrospinal fluid has been investigated by Hassin[47], and, further, Bhatia and Burn[48] have reported on the action of ether on the sympathetic nervous system. Neff[49] finds the present ether as supplied by the manufacturers to be generally pure but does not recommend its standing more than forty-eight hours in a gas machine.

In the estimation of the preoperative risk and the prophylaxis of postoperative complications in surgery of the biliary tract, Hussey[50] summarizes the available information, and McQuiston[51] shows that hypotension in itself is not a serious factor.

Constant efforts in oxygen therapy are producing new and better tents.

Studies in postoperative complications, especially pulmonary, continue, but no new startling conclusions have appeared. King[52, 53, 54], however, remains in the minority as regards the value of carbon dioxide in the prevention of pulmonary complications. Alison[55], Prinzmetal, et al[56], and Bergh[57] feel that inhalations of carbon dioxide are helpful. Overholt and Veal[58] show that certain chest conditions may be "normal" after surgical procedures. Coryllos[59] describes his technique of intratracheal anesthesia and bronchial suction as helpful in the prevention of complications in the surgical treatment of tuberculosis.

For 1934 anesthesia looks forward to a continued advancement to the end that benefits will accrue to both patient and surgeon.

REFERENCES

1 Ernst, M.: Evipan-natrium ein neues Mittel zur intravenösen Allgemeinnarkose. München. med. Wchnschr. 80: 128 (Jan. 27) 1933.

2 Baucks, K.: Erfahrungen mit der injizierbaren Evipan Natrium-Narkose. Zentralbl. f. Chir. 60: 306 (Feb. 11) 1933.

3 Jarman, R., and Abel, A. L.: Evipan intravenous anaesthetic. Lancet. 225: 18 (July 1) 1933.

4 A report on the clinical value of "evipan". Brit. J. Anesth. 11: 23 (Oct.) 1933. Also Lancet. 225: 43 (July 1) 1933.

5 Sebening, W., and Beck, W. C.: Intravenous sodium evipan. Anesth. & Analg. 12: 213 (Sept.-Oct.) 1933.

6 Wagner, C. P.: Pharmacologic action of barbiturates. Their use in neuropsychiatric conditions. J. A. M. A. 101: 1787 (Dec. 2) 1933.

7 Axelrod, M. L.: A preliminary report on the evaluation of alurate as a premedication agent in surgery. Am. J. Obstet. & Gynec. 26: 404 (Sept.) 1933.

8 Birdsall, S. E.: Sodium soneryl as a basal hypnotic. Brit. M. J. 1: 871, 1933.

9 Rutz, A.: Avertin Todesfall. Deutsche Ztschr. f. Chir. 240: 235 (Apr. 11) 1933.

10 Greeley, Horace, Jr.: Report of a case of hyperpyrexia and death following avertin anesthesia. Med. Times & Long Island M. J. 61: 38 (Feb.) 1933.

11 Brown, G.: A death under anesthesia. Brit. J. Anesth. 11: 16 (Oct.) 1933.

12 Evans, J. H.: Inhalation anaesthesia. New York State J. M. 33: 382 (Mar. 15) 1933.

13 Barlow, O. W., and Gledhill, J. D.: The tranquilizing and respiratory depressant effects of tribrom-ethanol (avertin) amylene hydrate, isoamylethyl-barbituric acid (amytal) and ethyl (1-methyl-butyl) barbiturate (pentobarbital) alone and in combination with morphine on the rat. J. Pharmacol. & Exper. Therap. 49: 36 (Sept.) 1933.

14 Barlow, O. W., and Duncan, J. T.: The influence of morphine on the premedication value of tribrom-ethanol (avertin) and tribrom-ethanol fluid (avertin fluid) in relation to nitrous oxide anesthesia in the rat. J. Pharmacol. & Exper. Therap. 49: 50 (Sept.) 1933.

15 Koontz, A. R., and Moulton, C. H.: Tribromethanol (avertin) narcosis in the treatment of lung oedema induced by chemical irritation. J. Pharmacol. & Exper. Therap. 47: 47 (Jan.) 1933.

16 Ashworth, H. K.: A sensitive test for the purity of avertin solution. Brit. M. J. 2: 489 (Sept. 9) 1933.

17 Leake, C. D.; Knoefel, P. K., and Guedel, A. E.: The anesthetic action of divinyl oxide in animals. J. Pharmacol. & Exper. Therap. 47: 5 (Jan.) 1933.

18 Gelfan, S., and Bell, I. R.: The anesthetic action of divinyl oxide on humans. J. Pharmacol. & Exper. Therap. 47: 1 (Jan.) 1933.

19 Herb, I. C.: The present status of ethylene. J. A. M. A. 101: 1716 (Nov. 25) 1933.

20 Sise, L. F.: Explosibility of nitrous oxide-ether mixtures. New Eng. J. Med. 208: 949 (May 4) 1933.

21 Lundy, J. S.: Anesthesia. Proc. Staff Meet. Mayo Clin. 8: 649 (Oct. 25) 1933.

22 Lindemulder, F. G.: Complications of spinal anesthesia. Am. Med. 39: 169 (Apr.) 1933.

23 Marvin, F. W.: Present status of various spinal anesthetics and their clinical usefulness. J. A. M. A. 101: 1475 (Nov. 4) 1933.

24 Kemp, W. N.: A résumé of spinal anesthesia. Am. J. Surg. 19: 534 (Mar.) 1933.

25 Grodinsky, M., and Baker, C. P.: Spinal anesthesia. Surg. Gynec. & Obst. 57: 187 (Aug.) 1933.

26 Tovell, R. M.: Spinal anesthesia. Canad. M. A. J. 28: 494 (Apr.) 1933.

27 Lundy, J. S.; Essex, H. E., and Kernohan, J. W.: Experiments with anesthetics. J. A. M. A. 101: 1546 (Nov. 11) 1933.

28 Harpin, R. A.: Caudal anesthesia in urology. New Eng. J. Med. 201: 31 (Jan. 5) 1934.

29 Dogliotti, A. M.: Research and clinical observations on spinal anesthesia with special reference to the peridural technique. Anesth. & Analg. 12: 59 (Mar.-Apr.) 1933.

30 Guedel, A. E. : A nontraumatic pharyngeal airway. J. A. M. A. 100: 1862 (June 10) 1933.

31 Flagg, P. J.: The response of the physician to the problem of asphyxia. Editorial. Am. J. Surg. 19: 352 (Feb.) 1933.

32 Flagg, P. J.: Resuscitation. New York State J. M. 33: 395 (Mar. 15) 1933.

33 Flagg, P. J.: The color of the blood as a sign of death. M. Times & Long Island M. J. 61: 205 (July) 1933.

34 Killian, H.: Coramin als Antidot bei Vergiftungen durch Narkotika und Hypnotika. Klin. Wchnschr. 12: 192 (Feb. 4) 1933.

35 Reese, H. H.: A method to counteract the narcotic and intoxicating effect of the barbituric acid drugs. Wisconsin M. J. 32: 530 (Aug.) 1933.

36 Wood, P. M.: Coramine in denarcotization and resuscitation. Preliminary report. Am. J. Surg. 22: 86 (Oct.) 1933.

37 Miner, L. M. S.: The dentists' achievement in the discovery and development of anaesthesia. New Eng. J. Med. 209: 945 (Nov. 9) 1933.

38 Beecher, H. K., and Bradshaw, H. H.: A method of measuring lung volume in dogs. J. Thoracic Surg. 2: 439 (June) 1933.

39 Beecher, H. K.; Bradshaw, H. H., and Lindskog, G.: Effect of laparotomy and abdominal distention on lung volume. J. Thoracic Surg. 2: 444 (June) 1933.
40 Beecher, H. K.: The measured effect of laparotomy on the respiration. J. Clin. Investigation. 12: 639 (July) 1933.
41 Beecher, H. K.: Effect of laparotomy on lung volume. Demonstration of new type of pulmonary collapse. J. Clin. Investigation. 12: 651 (July) 1933.
42 Orcutt, F. S., and Waters, R. M.: Diffusion of nitrous oxide, ethylene and carbon dioxide through human skin during anesthesia. Anesth. & Analg. 12: 45 (Jan.-Feb.) 1933.
43 Lundy, J. S.; Essex, H. E., and Kernohan, J. W.: Experiments with anesthetics. Proc. Staff Meet. Mayo Clin. 8: 88 (Feb. 8) 1933.
44 Emmett, J. L.: Subarachnoid injections of procaine: The quantitative effects of clinical doses on sensory, sympathetic and motor nerves. Proc. Staff Meet. Mayo Clin. 8: 441 (July 19) 1933.
45 Co Tui, F. W.: Experimental studies in subarachnoid anesthesia. New York State J. M. 33: 391 (Mar. 15) 1933.
46 Hill, E. F., and Macdonald, A. D.: Observation on experimental spinal anesthesia. J. Pharmacol. & Exper. Therap. 47: 151 (Feb.) 1933.
47 Hassin, C. B.: So called circulation of the cerebrospinal fluid. J. A. M. A. 101: 821 (Sept. 9) 1933.
48 Bhatia, B. B., and Burn, J. H.: The action of ether on the sympathetic system. J. Physiol. 78: 257 (June 12) 1933.
49 Neff, W. B.: The present status of anesthetic ether regarding its common impurities. Canad. M. A. J. 28: 627 (June) 1933.
50 Hussey, F. V.: Estimation of and methods of meeting surgical risks and postoperative complications in surgical diseases of the biliary tract. Rhode Island M. J. 16: 154 (Oct.) 1933.
51 McQuiston, J. S.: The relationship of arterial hypotension to surgical risk. Proc. Staff Meet. Mayo Clin. 8: 614 (Oct. 11) 1933.
52 King, D. S.: Postoperative pulmonary complications. J. A. M. A. 100: 21 (Jan. 17) 1933.
53 King, D. S.: Postoperative pulmonary complications. Surg. Gynec. & Obst. 56: 43 (Jan.) 1933.
54 King, D. S.: Post-operative pulmonary complications. The part played by the anesthesia. Anesth. & Analg. 12: 243 (Nov.-Dec.) 1933.
55 Alison, J. F.: Postanesthetic complications—prophylaxis and treatment. Am. Med. 39: 166 (Apr.) 1933.
56 Prinzmetal, M.; Brill, S., and Leake, C. D.: Post-operative pulmonary subventilation. Surg. Gynec. & Obst. 56: 129 (Feb.) 1933.
57 Bergh, G. S.: Prophylaxis of postoperative pulmonary atelectasis. Minnesota Med. 16: 105 (Feb.) 1933.
58 Overholt, R. H., and Veal, J. R.: The incidence, character and significance of abnormal physical signs in the chest occurring after major surgical operations. New Eng. J. Med. 208: 242 (Feb. 2) 1933.
59 Corylios, P. N.: Etiology, prevention and treatment of postoperative hemorespiratory complications in the surgical treatment of tuberculosis. Endotracheal anesthesia combined with bronchial suction. J. Thoracic Surg. 2: 384 (Apr.) 1933.

CANCER MORTALITY

Decrying the difficulty of obtaining accurate information respecting cancer mortality due to the fact, among others, that in a number of states the disease is not reportable by law, Dr. Louis I. Dublin on May 25 urged cancer specialists and the entire medical profession to coöperate with vital statisticians in an effort to secure more reliable data along these lines.

In an address on the "Incidence of Gastric Cancers" before the Symposium on Carcinoma of the Stomach, at the fiftieth anniversary of Memorial Hospital, Dr. Dublin presented statistics and facts pertaining to cancer of the stomach based upon the experience of his company's Industrial policyholders. He concluded that, in the United States, the stomach is the principal site of fatal cancer among white males and also very probably among white females; that the incidence of gastric cancer is approximately fifty per cent greater among white males than among white females; and that among white females, the death rate from gastric cancer and, by inference, the incidence of gastric cancer, appears to be decreasing at a rate greater than can be attributed to chance alone. "Among males," Dr. Dublin said, "the death rate has shown a slight tendency to increase but this is statistically significant only at the older ages of life."

He said that "possibly as many as one-third of the deaths actually due to cancer of the stomach are ascribed to other causes".

Pointing out that in 1932 a total of 27,000 deaths from gastric cancer were recorded for the population of the United States, he declared that "it is my judgment that instead of 27,000, the annual number of deaths from cancer of the stomach and duodenum in the country at large is now more likely to be close to 40,000, or about as many as from bronchopneumonia, or coronary disease, including angina pectoris".

The statistical picture, however, Dr. Dublin declared is improving.

"I give you these figures for the insured with the very strong conviction that they show us essentially what has been happening in this disease in the general population of the country.

"There was a total of 40,573 deaths from gastric cancer among these insured lives in the years 1917 to 1933 inclusive. These occurred among an annual average of fifteen million policyholders over this period. The average annual crude death rate was, therefore, 15.5 per 100,000 exposed. The gastric cancers constituted 20.8 per cent of all cancer deaths, the figures being much higher among the males than among the females."

He explained that deaths from gastric cancer are largely concentrated in the later ages of life. "There are few deaths under 25. At ages 25 to 34, the rates are still low—averaging less than two per 100,000 per annum. It is only after age 35 that the death rate from this disease has any real meaning. At 45 to 54 years, the rates are already fairly high.

"Among white males, the average death rate in this age group over this entire period of seventeen years was 46.7 per 100,000, as contrasted with 30.6 per hundred thousand among white females. The death rate almost trebles in the next age period. Among white males, it is 132.7 per 100,000; among white females, 85.2 per 100,000. In the next age period, that is, 65 to 74, the rate almost doubles among white males and more than doubles among white females. The interesting points in figures are first, that the rates rise with advancing age and, second, that they are much higher among the males than among the females, being, in fact, from a third to a half higher in the white race."

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 20251

PRESENTATION OF CASE

First admission. A sixty-one year old American widow entered for the first time eight months before her final admission.

Four months before admission she noticed a swelling on the left edge of her tongue. This swelling became sore and gradually increased to about one inch in diameter. She had worn a plate of false teeth in the upper jaw for eighteen years, and a few false teeth in the lower jaw. So far as she knew the plate fitted well and produced no irritation.

She had been seen in the Outpatient Department, where a biopsy showed an epidermoid carcinoma, grade III, and Hinton and Wassermann tests were positive.

There was no history of tuberculosis or cancer. She used no tobacco or alcohol.

The patient had been married for twenty-five years. Her husband died of heart failure five years before her admission. She had no children. She had had amenorrhea since the age of twenty-one. The cause of this was unknown.

She had had a cataract removed from her right eye nine years before admission. She had had severe frontal headaches, usually coming on in the evening. She had difficulty in hearing and occasional ringing in the ears. There was no history of precordial pain, palpitation, dyspnea or edema. She had pleurisy six years before admission, but no cough or hemoptysis.

Physical examination showed a well-nourished woman lying quietly in bed. There was a small cataract in the left eye, and the right eye showed an operative defect from the removal of a cataract. There was a large perforation of the bony septum of the nose. The lesion on the tongue was located on the left side and extended from the anterior pillar of the fauces halfway to the tip. No cervical glands were palpable. There was a soft precordial systolic murmur. A hard mass was palpable in the epigastrium, not tender, descending slightly with inspiration. The right lobe of the liver was not palpable.

The right ankle and knee jerks were not obtained.

Examination of the urine was negative. The blood showed a red cell count of 3,890,000, a hemoglobin of 60 per cent, a white cell count of 9,000.

A gastro-intestinal x-ray series showed a slight irregularity of the duodenal cap on its upper border. No definite ulcer crater could be visualized.

Radium seeds were implanted in the carcinoma of the tongue. The following day x-ray therapy was started. She was discharged three days after admission and told to return to the Outpatient Department for further x-ray treatment.

History of interval. Except for some smarting of her tongue during eating and increased irritability because of her headaches she was perfectly well following her discharge until three days before readmission. At that time, while waiting for x-ray treatment, she complained of a sick feeling in her stomach and suddenly vomited about a quart of watery food material mixed with blood. Her blood pressure was 140/85. At the previous admission it was 190/90.

Second admission, eight months after her previous discharge. She was kept in the Emergency Ward under observation. The following morning she suddenly vomited a quart or more of bright red blood and simultaneously had a bowel movement. The blood pressure dropped to 60/30 and the pulse rose to 140. She was placed on the shock table and given morphine and later a slow intravenous injection of two and a half per cent glucose. There was some improvement and her blood pressure rose to 108/35. Physical examination was practically the same as on her previous admission. The same smooth firm mass was felt in the upper epigastrium. Examination of her blood showed a red cell count of 3,050,000, a hemoglobin of 70 per cent, a white cell count of 10,800, with 90 per cent polymorphonuclears. The non-protein nitrogen of the blood was 62 milligrams, the blood sugar 139 milligrams, and the carbon dioxide combining power 48.2 volumes per cent.

She was given 600 cubic centimeters of citrated blood. The blood pressure rose to 120-140 systolic. She became comatose and had almost an acidotic breathing. She developed fluid in her chest and shortly before death had a generalized convulsion during which her face was drawn over to the right. She died the day following admission.

DR. TRACY B. MALLORY: Dr. Winn, there is one thing that was not entirely clear from the record. Did she ever recover consciousness from the complete shock?

DR. W. A. WINN: Not after the time of the second hemorrhage. She was irrational. The visiting physician brought up the question whether or not she had had too much morphia or whether the high non-protein nitrogen caused her coma.

Differential Diagnosis

Dr. Robert R. Linton: In going over this case I have selected what I think are the essential points in the history. First of all she was sixty-one years old. At the time of her first admission she had cancer of the tongue, grade III, which was adequately taken care of, or presumably so, with radium and x-ray therapy. It was noted at that time that she did not have any enlarged lymph nodes in her neck, so I presume she did not have any metastases.

The next thing of interest in the past history is that she had a positive Wassermann and a positive Hinton. So far as I can see this condition had not been treated.

The story that she had no children is of interest, although I think it has nothing to do with the cause of death. Her amenorrhea undoubtedly explains the fact that she did not have any children. What the exact cause of that was I hesitate to say. It may have been an endocrine condition and it may possibly have been a luetic or tuberculous condition.

In addition she also had bilateral cataracts, one of these having been removed and the other being still present, but apparently it did not bother her enough for her to have anything done about it.

On physical examination at the first entry she had a lesion on her tongue and in addition a perforated nasal septum. Her right ankle and knee jerks were not obtained.

Of significance I think was the mass that was felt in the midepigastrium, described as hard and smooth and moving on deep inspiration. I think we should pay particular attention to that mass in trying to explain her death.

Laboratory examination at that time showed that she had a secondary anemia.

X-ray examination showed a defect in the duodenal cap, but they could see no definite ulcer.

She went home after she had had her radium and x-ray therapy and returned eight months later, presumably for further x-ray treatment. Her history in this intervening time shows that she was fairly well. She did have some headaches and I think had not felt quite up to par, although we are told here that she had felt perfectly well.

The acute episode apparently started with the vomiting of a large amount of watery material which was food with blood mixed with it. That amount of bleeding of course would not point to any one lesion in particular except that there was some pathology in the gastro-intestinal tract. There is no question that the blood was coughed up; it apparently was vomited. The next morning she vomited a quart of bright red blood and with that she had a fall in blood pressure. That I think is of considerably more significance than the fact that she had been vomiting food with a little blood in it.

In spite of transfusion she rapidly went downhill. Her blood studies and laboratory examinations were essentially negative except for the elevated non-protein nitrogen, which was taken in a period of shock and I think might possibly be explained by lowering of the blood pressure and shutting down of urinary excretion. Following the transfusion she became comatose and died in a convulsion, the face drawing over to one side. I should presume that was the terminal event and not the real cause of her death.

To review the possibilities that this patient might have: I think we shall agree that the cause of death was primary acute hemorrhage, and that it probably came from the gastro-intestinal tract.

I forgot to mention that the mass in the midepigastrium on the second admission was exactly the same as at the previous entry. I think that is of considerable importance. She had carcinoma of the tongue. It is possible but very improbable that she might have had metastatic carcinoma which was showing itself in the liver. Against that also is the fact that the mass in the epigastrium had not changed. Carcinoma of the tongue I think very rarely if ever metastasizes to the liver. So I think we cannot explain her death on the basis that it might have been a metastatic lesion of cancer.

Then there is the question whether or not she had a duodenal ulcer. Her history is against that because she had no gastro-intestinal symptoms. The x-ray suggested a duodenal ulcer, but this was not definite. I think we can pretty definitely rule out duodenal ulcer as the cause of her acute hemorrhage.

It is possible she had a cancer of the stomach with metastases to the liver and hemorrhage from the carcinoma in the stomach. Against that, however, is the fact that the mass in the epigastrium had not changed in size.

One of the most common causes of acute hemorrhage and massive hemorrhage such as this is esophageal varices associated with cirrhosis of the liver. Physical examination noted that the mass could be felt in the left, but the right lobe could not be felt. I do not think that means a small right lobe. It may possibly have been a large lobe, for it may have been there but not have been palpated. No note is made as to the size of the liver to percussion. That might have given us a clue as to the size. There is the question of the etiology of the cirrhosis, if she had it. In the history it states that she took no drugs and no alcohol. So presumably it was not an alcoholic cirrhosis. She had a positive Wassermann and had it for a good many years without treatment I presume, and she had symptoms of tertiary lues and a positive blood. It seems to me most likely that she died of acute hemorrhage from esophageal varices associated with

cirrhosis of the liver which I think may be luetic in origin.

Dr. Grantley W. Taylor: In regard to the etiology of her tongue condition, we have found that carcinoma of the tongue very frequently originates on a luetic basis. The Wassermann is positive in about twenty-five per cent of the cases of carcinoma of the tongue, which often perhaps brings about some delay in prompt treatment of cancer of the tongue, because a diagnosis of lues is made and at first it is assumed that the condition is a simple luetic glossitis without secondary carcinoma. The only other etiologic factor is possibly the false teeth, but those dentures are much more commonly associated etiologically with carcinoma of the palate or jaw than of the tongue.

In regard to the treatment of her tongue lesion, which appeared to be temporarily effective, we are getting more and more to depend on radiation almost to the exclusion of surgery in treatment of carcinoma of the tongue. If there are bad dental conditions or sepsis we try to clean them up and then combine interstitial radium treatment with x-ray treatment in doses which are very massive as compared with the treatment we used a few years ago.

The handling of the lymph node areas by operation seems to me much less common now than it was ten years ago. Cures of carcinoma of the tongue in which the cervical lymph nodes are involved are very rare and limited almost entirely to those cases which show only microscopic evidence of lymph node involvement. If there is evident gross involvement with metastatic disease the case is essentially incurable by any means. In regard to the possibility of remote metastasis from carcinoma of the tongue it does occur, but it is extremely rare. Dr. Lund reviewed in the neighborhood of eleven hundred cases of carcinoma of the buccal mucosa in general at the Huntington Hospital and found no instances of metastasis beyond the clavicle. I recall one case with liver metastasis. When I was talking about it with Dr. Hartwell he remembered one case, and it developed that they were the same case. I have seen one case with pulmonary involvement, but it must be extremely rare, and I think it would be unwise to assume that it had anything to do with this condition from which she died.

Dr. William B. Breed: I am impressed with the ease with which Dr. Linton ruled out hemorrhage from the duodenum on the basis of no digestive symptoms, because so many of these cases that bleed from the duodenum have had no digestive symptoms. I think these cases bleed more often than the ones that have had symptoms.

Dr. Mallory: There is one other point that deserves a little discussion, and that is the development and persistence of coma in this case. It brings up the question as to whether or not there was a cerebral lesion.

Dr. W. Jason Mixter: I think the question of coma is of considerable importance, and also the question of convulsions. In going over the records we find that the reflexes are present on one side and not on the other. It seems to me that an intracranial lesion must be suspected.

Clinical Diagnoses

Carcinoma of tongue, grade III.
Late syphilis.
Hematemesis.
Cirrhosis of the liver?
Cerebral hemorrhage.

Anatomic Diagnoses

Cirrhosis of the liver, toxic type.
Esophageal varices.
Duodenal erosion.
Intestinal hemorrhage.
Pulmonary edema.
Pulmonary emphysema, slight.
Operative wound—radiation scar for carcinoma of tongue.
Operative wound—removal of cataract, right eye.

Pathologic Discussion

Dr. Mallory: The autopsy here showed according to Dr. Linton's prediction a very marked cirrhosis of the liver. There were esophageal varices, rather slight ones; we were unable to demonstrate a bleeding point. In addition I can side with Dr. Breed, because there was a shallow ulcer in the duodenum. So from which of these two lesions she bled I do not know. At autopsy it seemed equally possible that either was the source of the hemorrhage.

The cirrhosis was a coarsely nodular one. The right lobe was very small and the left lobe distinctly a little big. The spleen was not enlarged, so the mass which had been felt was certainly the left lobe of the liver.

The brain I am going to ask Dr. Kubik to tell you about. We have had two or three cases somewhat similar to this in patients who have had shock or hemorrhage.* In each case there has been a tremendous drop in blood pressure which persisted for some time and definite cerebral symptoms developed, but we have not been able to find any occlusion of vessels or any hemorrhage. It raises the question whether the tremendously lowered blood pressure may result in cerebral degeneration. This patient had been carrying a pressure of 190, so that a drop to 60 would be more significant than in a non-hypertensive case. It seems possible that that is the cause of the cerebral lesion.

Dr. Charles S. Kubik: Although there was no gross circumscribed lesion such as hemorrhage or infarct, there was found on microscopic

examination an interesting condition with a bilateral diffuse distribution in the cerebral cortex. Ganglion cells were damaged, glia cells (astrocytes) were swollen and increased in number and there was a decided increase in the amount of fibrous glia. The changes were much more pronounced in the fifth and sixth laminae, that is in the deep layers of the cortex. The glial changes are not restricted to the grey matter, but are also found in the outer zone of subcortical white matter. It is rather remarkable that there was little if any arteriosclerosis. The main arteries had thin translucent collapsed walls. There was probably some arteriosclerosis, but this did not seem to be marked.

The deep layers of the cortex seem to be particularly susceptible to degenerative changes. I recall two cases of delirium, one of which was probably a toxic affair resulting from the use of sedative drugs, in which similar changes were found. In another case, where death occurred two weeks after a severe degree of asphyxia, there was marked degeneration with complete destruction of myelin in this same region. The fact that this part of the cortex is particularly vulnerable when exposed to the effects of anoxemia or toxic agents is probably dependent in some way on the arrangement of its blood supply. In the case before us it is reasonable to suppose that the degenerative changes are due to a deficient supply of blood, resulting from hemorrhage and exceedingly low blood pressure. The convulsion was probably a manifestation of relative anoxemia.

Dr. Alfred Kranes: We have had several cases in the past two years in which after morphia the patients with cirrhosis became more and more comatose, almost like a myxedematous reaction to the drug. I wonder if any one else has seen it.

Dr. Edward B. Benedict: With regard to the hemorrhage, since the pathologists could not be sure of its source in this case, no one can tell, but Rivers and Wilbur of the Mayo Clinic recently reported that of all cases of gross hematemesis over 50 per cent are due to duodenal ulcer and only about 5 per cent are due to esophageal varices.

Dr. Mallory: It is the commonest cause, although this was a very shallow ulcer, not a particularly massive one.

CASE 20252

Presentation of Case

A forty-eight year old unemployed Finn, formerly a dock laborer, entered complaining of weakness, abdominal pain and jaundice.

Approximately one year before admission he began to have mild indigestion and diarrhea. Over a period of one month he lost about ten pounds in weight. His family physician prescribed some drops to take at meal times. The diarrhea cleared up, but he remained weak and continued to lose weight. About five months before entry he visited a large medical center in New York City where a diagnosis of pernicious anemia was made and liver therapy was begun. At about this time he developed a dragging sensation in his abdomen and a little later definite pain which radiated to the pubis. The pain was severe enough to keep him awake at night. He spent the summer before admission in Maine. His diet consisted for the most part of milk, lettuce, spinach and string beans. During the past three months he had vomited about once a month and during the past three weeks about once a week. The abdominal discomfort became worse. Three days before admission he developed a constant diarrhea consisting of three to five loose watery movements a day. He believed that he had been slightly jaundiced during these events and that he had lost in all approximately thirty-two pounds in weight. During the past month he had had slight edema of his right ankle.

The family and marital histories are non-contributory. The past history is negative.

Physical examination showed an emaciated, sunburned elderly man. The skin and mucous membranes were pale but not jaundiced. There was marked pyorrhea and caries of the teeth. There was a soft basal systolic murmur. The fundi showed moderate sclerosis. The blood pressure was 155/65. The pulse was 112 and Corrigan in character. The abdomen was protuberant and dull to percussion. This was interpreted as fluid. There was a hard irregular mass above and to the left of the umbilicus but below the epigastrium. There was a small strangulated hemorrhoid.

The temperature was 100°, the respirations 20.

Examination of the blood showed a red cell count of 3,200,000 with a hemoglobin of 45 per cent. The white cell count was 25,000, with 82 per cent polymorphonuclears. A smear showed the red cells to be normal. Examination of the stools was negative. A Hinton test was negative. A liver function test showed ten per cent retention. The icteric index was 8.

He failed very rapidly and died two days after admission. The terminal white cell count was 42,000.

Differential Diagnosis

Dr. Daniel F. Jones: I always have admired Dr. Richard Cabot for the way he could make a diagnosis from these histories, and I admire him still more after seeing this history. He must have run across very similar cases in his long period of doing this work. I do not know that I have ever seen a history that has so little in it that is of any value. The patient comes in complaining of weakness, which is of importance, and which has been increasing for quite a period. He has abdominal pain, and the note

says that he has jaundice. The first question is whether he ever did have jaundice, and if possible the value of that statement by the patient should have been indicated in some way. It is evident that he did not have jaundice, or probably did not have jaundice, because he went to a clinic in New York where he was found to have "pernicious anemia". In addition to that a blood test was done here and the test for bile was found to be negative.

If we go on through the history we have some important points, but not very helpful in making a definite diagnosis. He has mild indigestion and diarrhea, which means something, but it could mean so many things that it does not mean much. The diarrhea cleared up. If it cleared up what we ought to know is whether or not he was then markedly constipated. That would help us in deciding as to whether he had something in the intestine; but merely to say he had diarrhea which cleared up is not of any value to the man who is reading the history.

He visited a large clinic in New York where a diagnosis of pernicious anemia was made. That would suggest that he did not have jaundice before he came in, but was sallow, the term that is used by laymen so much but does not mean jaundice in the great majority of cases.

We are in a hole in this case, so to speak. We have nothing to go on. When a patient has pain in the abdomen, that is of no value in making a diagnosis. If he has pain we must know what it is like, where it is, how severe it is, whether cramp-like, whether constant, and many other things, none of which are given us here, except the one thing a little later, a definite pain which radiated to the pubis. Abdominal pains radiating to the pubis are not very helpful. They sometimes suggest something in the bladder or pelvis, but that is all we can say about that. We get the severity of the pain later in that it kept him awake at times.

We have another point to help us out. One might not think it much, but with a history like this we have to jump at minor details. Here is a man who had milk, lettuce and string beans during the summer and nothing is said in regard to constipation or diarrhea during that time. That would suggest to my mind that he did not have any constriction of his bowel, because with such coarse food he certainly ought to have become much more constipated.

Three days before admission he developed constant diarrhea, three to five watery movements a day; and the patient believed he was jaundiced. The sudden development of loose watery movements without a pretty careful previous history would not suggest anything definite to me. It certainly ought not to suggest, after such a long period, a constricting growth in the bowel.

He has lost a tremendous amount of weight.

Another thing which I would call to your attention is that he has slight edema of the right ankle. I would call that to your attention because we have a mass in the left upper abdomen, but no other mass. That ought to suggest then a metastasis or something in the lower abdomen pressing on the right iliac vein rather than the left. We have the mass in the left side, therefore that should have nothing to do with the edema of the ankle.

When we come to the physical examination, what can we get out of that? He is a sunburned man, pale, but not jaundiced. So it is probable that he never has been jaundiced with our other evidence. There is marked pyorrhea and caries of the teeth, which amounts to very little. The abdomen was protuberant and dull to percussion. I agree entirely with what Dr. Vincent said in regard to fluid in the abdomen, that it is a very difficult condition to determine accurately. I have seen all sorts of men make all sorts of errors in regard to it. But his abdomen was protuberant and was dull to percussion. We must pay some attention to that; probably fluid.

There is a hard irregular mass just above the umbilicus but below the epigastrium. That is pretty slight evidence. It moved slightly with respiration. We do not know whether it moved by manual pressure. So that this mass is rather an indefinite thing. We do not know whether it is retroperitoneal, whether it is in the transverse colon, whether it is in the omentum, or whether it is deep in the region of the pancreas, although of course if it is pancreas it would be at the lower border of the pancreas and not at the usual site for growth in the pancreas.

His temperature was 100°, which is of very little value in making a diagnosis. When there is a mass in the abdomen you could get an increased temperature and do get it very frequently in malignant disease, and it does not necessarily mean an inflammatory process.

The hemoglobin was 45, the white cell count 25,000. 25,000 is rather high, but still we could say that it was due to malignant disease.

Examination of the stools was negative. For what was it negative? Was it negative for blood? We do not know.

He had a negative Hinton test. The liver function showed 10 per cent retention. The icteric index was 8. He failed rapidly and died two days after admission.

In a case as blind as this a very careful, thorough examination of the abdomen is of importance. I do not see how one can possibly make a diagnosis without one.

The next thing is that we know there is a mass in the abdomen, with the suggestion of fluid, and great loss of weight, so we have a right to assume that this is malignant disease. This is, then, malignant disease, and we have some evidence that there is something on the right side of the pelvis to cause edema of the

right ankle. There ought to be something in the pelvis to be made out in some way, and we have no rectal examination. That according to my thoughts would be of the greatest importance. So that we are trying to make a diagnosis on what I should call a very small history with very little in the way of physical examination. We have a mass in the left upper quadrant, not well up in the quadrant but beyond the umbilicus. If it were in the transverse colon it should be somewhat movable and we ought to find something such as blood to suggest that it is in the transverse colon. If it is in the omentum then we should find something that would suggest that it is in the omentum, as proximity to the anterior abdominal wall, or its arc of rotation. We have none of these things to help us.

There is one other point that we must consider, that is, his great loss of weight and diarrhea. We might consider in such a case as that with a mass in the position of this mass a carcinoma or a growth of some kind in the pancreas that would account for the location of the mass, for the diarrhea, for the great weakness and for his color, but it would hardly account for the 45 per cent hemoglobin. I do not know how to account for that with a negative examination of the stool. A man with 3,200,000 red cells and 45 per cent hemoglobin ought to have had bleeding from somewhere, ought to have had a long continued hemorrhage. We must not forget that in growths in the colon from the cecum to the splenic flexure one symptom they have of importance is anemia, that many cases of carcinoma of the cecum have nothing but anemia and no pain. We have no pain suggesting large intestine pain, that is, pain below the umbilicus, except this pain which radiates to the symphysis, which means very little to my mind, and does not suggest pain due to the large intestine. So we have no pain suggesting the large intestine unless the man was so far along with his obstruction that the pain was localized near the growth. Then a patient forgets entirely that he has lower abdominal pain and says it is located in the region of the growth, and this man was far advanced.

I shall have to make a diagnosis in this case on general principles, that is, a man who had lost a great deal of weight, was anemic, had a mass in the left upper quadrant a little above the umbilicus, pain radiating to the symphysis, and abdominal pain, whatever that means. Abdominal pain would mean to me nothing in particular. I could not get anything definite out of it. If I only knew what was in the pelvis I should feel very much more certain about the diagnosis. However, we do not know what was in the pelvis, therefore we must go on general principles, loss of weight, loss of strength, a mass just above the umbilicus, indefinite abdominal pain, fluid, all suggesting to my mind a general carcinomatosis of the abdomen rather than a growth in the pancreas or a growth in the large intestine. I feel that we should have some cause for the 45 per cent hemoglobin, which suggests hemorrhage to my mind.

Clinical Diagnosis

Abdominal malignancy.

Anatomic Diagnosis

Carcinoma of the stomach with perforation into the transverse colon.

Pathologic Discussion

Dr. Tracy B. Mallory: I should like to assure Dr. Jones that we did not leave out anything. We gave him the entire history as it stands in the record and would gladly give him more if we could.

The point that interested me in this man's story was the fact that he had a flat-footed diagnosis of pernicious anemia made about a year and a half before at a leading hospital in New York, presumably on adequate grounds, and then he later developed the picture of malignancy. How much one would be justified in concluding from that I do not know, but it is certainly a fact that carcinomas of the stomach are not infrequently associated with a pernicious anemia blood picture which might lead one to place the malignancy there even though the physical examination did not particularly suggest it.

Our autopsy was limited to a six-inch incision in the abdomen, which the surgeons would probably consider very adequate, but which hampered us slightly, and I do not think we made as careful an exploration of the pelvis as Dr. Jones would have liked us to make. We did find a large tumor mass in the upper abdomen which involved both the stomach and the transverse colon, and a definite fistula between the two. So I think there is very little question but that it is primary carcinoma of the stomach ulcerating through to the transverse colon in the very last few days of life and would probably account for the sudden terminal development of diarrhea. The negative stools made it impossible to make that diagnosis ante mortem.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $8.52 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 The Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 The Fenway, Boston, Mass.

SOME FEATURES OF THE A. M. A. CLEVELAND MEETING

A LARGE and enthusiastic meeting of the American Medical Association convened at Cleveland for the week beginning Monday, June 11, 1934.

The section meetings were of great excellence, and well attended. The scientific exhibits presented the latest advances in dealing with disease, public health problems, and social features of medicine. These exceeded the variety and scope of previous years, and one might spend the entire week to advantage in study of the instruction provided in this department.

As a form of medical education, if the graduating classes of medical schools could have been brought to Cleveland this year and conducted through the spacious hall in which this scientific display was presented, the average student would probably supplement his four years of study with more exact and useful information than he has acquired hitherto.

In several instances motion pictures set forth the facts in an impressive manner.

The *Cleveland Plain Dealer* in reporting the session of the House of Delegates referred to health insurance and veterans' hospitalization as "hot pokers" introduced into the deliberations of this legislative body of the Association. The reaction to the hospitalization of veterans was a repetition of previous expressions. The references to health insurance were in response to a resolution by the Michigan State Medical Society asking for the appointment of a committee to consider the A. M. A. policy toward mutual health service, and also the report of the medical service Board of the American College of Surgeons to the Board of Regents in which are set forth the recommendations of this Board as shown in a copy furnished by Dr. Franklin H. Martin which appears on page 1345 of this issue.

This report was accepted and approved by the Board of Regents of the American College of Surgeons, and shows that this body, as represented by its Regents, believes in health insurance for the low income group, with the elimination of certain objectionable features of the customs abroad. This document also suggests minimum standards for industrial medicine and traumatic surgery.

It is of interest to note that Dr. Robert B. Greenough is chairman of the Medical Service Board of the American College of Surgeons. When the attention of the House of Delegates was called to the Michigan request and the action of the College of Surgeons, Dr. Charles I. Whalen of Chicago voiced his disapproval of the attitude of these organizations, and a recess committee was appointed to consider the request of the Michigan State Society. This probably means that no action will be taken on this report until the House of Delegates meets again, and is an indication of a desire to postpone action although this subject has been under discussion for more than a year.

When this appeal of the Michigan Society came before the House of Delegates, the House went into executive session, but the newspaper reports of the proceedings indicated disapproval of any action by organizations of constituent members of the American Medical Association.

In defining its position the House of Delegates adopted a ten-point declaration of policy contained in a report of a committee headed by Dr. Nathan B. Van Etten of New York which is as follows:

1—All features of medical service in any method of medical practice should be under the control of the medical profession. No other body or individual is legally or educationally equipped to exercise such control.

2—No third party must be permitted to come between the patient and his physician in any medical relation. All responsibility for the

character of medical service must be borne by the profession.

3—Patients must have absolute freedom to choose a legally qualified doctor of medicine who will serve them from among all those qualified to practice and who are willing to give services.

4—The method of giving the service must retain a permanent, confidential relation between the patient and a "family physician". This relation must be the fundamental and dominating feature of any system.

5—All medical phases of all institutions involved in the medical service should be under professional control, it being understood that hospital service and medical service should be considered separately. These institutions are but expansions of the equipment of the physician. He is the only one whom the laws of all nations recognize as competent to use them in the delivery of service. The medical profession alone can determine the adequacy and character of such institutions. Their value depends on their operation according to medical standards.

6—However the cost of medical service may be distributed, the immediate cost should be borne by the patient able to pay at the time the service is rendered.

7—Medical service must have no connection with any cash benefits.

8—Any form of medical service should include within its scope all qualified physicians of the locality covered by its operation who wish to give service under the conditions established.

9—Systems for the relief of low income classes should be limited strictly to those below the "comfort level" standard of incomes.

10—There should be no restrictions on treatment or prescribing not formulated and enforced by the organized medical profession.

Much of this is quite like the plan adopted by the Michigan State Society, and also in conformity with several features of the report accepted by the Board of Regents of the American College of Surgeons, and it seems unusual for an organization like the American Medical Association to be disturbed because other organizations whose members are also members of the larger organization are studying existing conditions and codifying conclusions.

The feeling expressed by the President of the New Jersey Society at the last annual meeting of that society to the effect that the American Medical Association has been disinclined to formulate policies, has been endorsed in some quarters, and justifies independent study and action even by members of the A. M. A. Although the great power and creditable accomplishments of the A. M. A. are recognized, the attitude of criticism of honest attempts to clarify some of the great problems before the country has not been conducive to harmony.

The general spirit of the Cleveland meeting as shown in the devotion to the service of humanity was a reflection of the ambition of the profession to advance medicine to still further knowledge of the problems before it. This convention was one of the best in the history of organized medicine.

The President-Elect is James Somerville McLester who was born in 1877 and graduated from the University of Virginia, Department of Medicine in 1899. He is Professor of Medicine in the University of Alabama School of Medicine with an office at 930 South 20th Street, Birmingham, Alabama.

Massachusetts was recognized in the election of Dr. Roger I. Lee to the position of Trustee. Dr. Emmett C. North of Missouri was elected a member of the Judicial Council.

The next annual meeting will be at Atlantic City.

QUINTUPLETS

DESPITE the bursts of public enthusiasm and inspirational journalism which have attended the most extraordinary instance so far recorded of what might euphemistically be termed synchronous multiparity, the birth of quintuplets is nevertheless of distinct medical interest. In all medical history something over thirty cases of quintuplets have been recorded; no properly authenticated case of sextuplets. Prior to the notable achievement of Olivia Dionne, no unquestionable set of quintuplets has survived as such for more than fifty minutes. At the time of writing the Canadian quintuplets, weighing a total of thirteen pounds at birth, have traveled in each other's company, their ranks unbroken, through this vale of tears for fifteen days. Perhaps they are aware of their goal and are striving for its attainment—exhibitionism on a family pedestal in the World's Fair at Chicago.

According to Professor Alan F. Guttmacher of Johns Hopkins University, multiple births are most likely to occur between the ages of thirty-five and forty. The mother of our present quintuplets is an exception to the rule, boasting only twenty-four summers; seven less than her husband. The rarity of birth multiplicity increases, obviously, with the number of babes at the birth. W. W. Greulich of the University of Colorado studied 100,000,000 births, establishing one in 87 as the chance for twin births. The square of 87, or 7,569 gives the chances in favor of triplets; its cube, or 658,503 the chances in favor of quadruplets. If this rule continues to hold true in the higher registers, quintuplets should make their appearance once in every 57,289,761 births!

The chances of all five surviving the period of infant mortality, at this rate, would require an array of digits so far known only to astronomy.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

ROCK, JOHN. S.B., M.D. Harvard University Medical School 1918. F.A.C.S. Assistant in Obstetrics and Gynecology, Harvard University Medical School. Assistant Obstetrician, Massachusetts General Hospital. Surgeon to Out-Patients, Free Hospital for Women, Brookline. His subject is "Artificial Menstruation. Effect of Female Sex Hormones in Amenorrhea." Page 1303. Address: 224 Commonwealth Avenue, Boston, Massachusetts.

KUHNS, JOHN G. A.B., M.D. Johns Hopkins University School of Medicine 1924. Assistant in Orthopedic Surgery, Harvard Medical School. Assistant Orthopedic Surgeon, Children's and Robert B. Brigham Hospitals. Consulting Orthopedic Surgeon, Sturdy Memorial Hospital, Attleboro. His subject is "Congenital Scoliosis. A Review of Seventy-Seven Patients." Page 1310. Address: 372 Marlboro Street, Boston, Massachusetts.

DAVIS, MAX. A.B., D.N.B., M.D. Harvard University Medical School 1925. F.A.C.S. Instructor in Obstetrics and Gynecology, Boston University School of Medicine. First Assistant Obstetrician, Massachusetts Memorial Hospitals. Gynecologist, Out-Patient Department, Massachusetts Memorial Hospitals. Assistant, Tumor Clinic, Beth Israel Hospital. Address: 311 Commonwealth Avenue, Boston, Massachusetts. Associated with him is

WALKER, ELISABETH W. B.S., M.A. Address: 311 Commonwealth Avenue, Boston, Massachusetts. Their subject is "The Anemias of Pregnancy." Page 1315.

CLERF, LOUIS H. M.D. Jefferson Medical College 1912. F.A.C.S. Professor of Bronchoscopy and Esophagoscopy, Jefferson Medical College, Philadelphia. His subject is "Bronchoscopy in the Treatment of Pulmonary Abscess and Bronchiectasis." Page 1319. Address: 1530 Locust Street, Philadelphia, Pennsylvania.

HAWES, JOHN B. 2ND. A.B., M.D. Harvard University Medical School 1903. President, Boston Tuberculosis Association. Director, Massachusetts Tuberculosis League, National Tuberculosis Association, and Rutland Cottage Sanatoria. Address: 11 Marlborough Street, Boston, Massachusetts. Associated with him is

WOOD, NATHANIEL K. A.B., M.D. Harvard University Medical School 1901. Physician-in-Charge, Arlington Street Tuberculosis Class. Associate in Medicine, Peter Bent Brigham Hospital. Chairman, Preventorium Committee of the Boston Tuberculosis Association. Address: 520 Beacon Street, Boston, Massachusetts. And

KING, DONALD S. A.B., M.D. Harvard University Medical School 1918. F.A.C.P. Assistant Physician, Massachusetts General Hospital in charge of Pulmonary Clinic. Assistant in Medicine, Harvard Medical School. Physician, Channing Home. Member of Executive Committee, Boston Tuberculosis Association. Address: 205 Beacon Street, Boston, Massachusetts. Their subject is "A Study of Ten Years' Work at the Prendergast Preventorium of the Boston Tuberculosis Association." Page 1321.

LYNCH, D. L. M.D. Tufts College Medical School 1907. Medical Director, New England Telephone & Telegraph Company. His subject is "The Management of Industrial Accidents Affecting the Employees of the New England Telephone Company." Page 1324. Address: 483 Beacon Street, Boston, Massachusetts.

COTTON, FREDERIC JAY, M.D., AND MORRISON, GORDON MACKAY, M.D. See page 817, issue of April 12, for records of authors. Their subject is "Artificial Ligaments at the Knee—A Technique." Page 1331.

SHELDON, RUSSELL F. A.B., M.D. Harvard University Medical School 1911. Assistant Anesthetist, Massachusetts General Hospital, and Massachusetts Eye and Ear Infirmary. His subject is "Progress in Anesthesia in 1933." Page 1333. Address: 31 Pinckney Street, Boston, Massachusetts.

MISCELLANY

BOSTON MEDICAL LIBRARY

The settling of an estate has provided an exceptional opportunity for the procuring of a lot of twenty-one manuscripts and incunabula for the Bullard and Hyams Collections.

Two notable and exceedingly important manuscripts are included in the lot: the "De proprietatibus rerum" of Bartholomaeus Anglicus and the Organon or Logica of Aristoteles. Both of these books were common textbooks in the Middle Ages, and essential for all scholars.

The manuscript of Bartholomaeus is a very large work of 298 leaves of vellum and probably was written in the North of Spain in the last part of the thirteenth century. It is said to be from the Abbey of Leyre in Spanish Navarre and is in the original binding of deerskin over wooden boards with primitive iron bosses. The end leaves used in the binding are parts of a vellum manuscript of the decretals of Gregory X. The text is a good one and well written.

Bartholomaeus Anglicus was a Franciscan who was born in England and who flourished in the thirteenth century from about 1220 to at least 1250 A.D. His encyclopedia, which was written about 1230 to 1240, was for the plain people and was entitled "The properties of things." It was written in Latin and

based on the Bible, and while its aim was primarily theological and philosophical, it had much of natural history in its contents. It was comprehensive and methodical.

The work is divided into nineteen books which may be roughly designated as follows: 1 God; 2 angels and demons; 3 psychology; 4-5 physiology; 6 family life; 7 medicine; 8 cosmology and astrology; 9 time divisions; 10 form and matter and elements; 11 air and meteorology; 12 flying creatures; 13 waters and fishes, dolphins and whales; 14 physical geography; 15 political geography; 16 gems, minerals and metals; 17 trees and herbs; 18 animals; 19 color, odor, savor, food and drink; eggs; weights and measures; musical instruments. According to Sarton, the medical chapter is largely derived from Constantinus Africanus and the Herbal is by far the most notable work of its kind written by an Englishman in the Middle Ages.

The work was very popular and was translated in the manuscript period into Italian, French, English and Spanish and all of these translations were published in Incunabula editions. Fifteen editions were printed in Latin alone during the fifteenth century and it continued to be printed until the early part of the seventeenth century. It was one of the books made available to Paris students for a definite fee.

Aristotelian logic was a primary subject in the curriculum of the schools and universities of the Middle Ages. The manuscript in the Library contains the usual course in logic, part of which is in the version of Boethius. It is written in good Gothic hand on 111 leaves of vellum and is probably Italian fourteenth century work. There are numerous interlinear and marginal notes in several hands, contemporary with the manuscript and later, and many erasures and corrections of the text, mostly in a hand not much later than that of the manuscript.

The initials are in red and green, with edges prolonged to form borders, and some have primitive grotesque ornaments like Italian work of the fourteenth century.

The text closely approximates that of the first printed edition of the "Organon" (Naples, 1473-78).

The "Libro delle consolazione delle medicine simplici," of Joannes Mesue, Junior, printed at Modena, 1475, is a very important and very rare incunabulum. It is the first edition of the Italian translation of the celebrated and popular work of Mesue and the first large medical book in the Italian language. The "Grabadin" or apothecary's manual of the pseudo-Mesue, was very popular in the Middle Ages. The Latin printing of 1471 shares with the two Jenson tracts of the same year the honor of being the first dated medical books.

Volume one of the "Rosarium sermonum" of Bernardinus de Bustis, Venice, 1498, contains an important unnoted sermon on the pest entitled "De pestilentie signis causis et remediis." In this sermon many medical authorities are quoted among which may be mentioned, Hippocrates, Galen, Haly Abbas, Averroes, Albertus Magnus, Petrus de Abano, Aristoteles and Avicenna. Mention also is made of the great plague at Milan in 1451.

The "Sermones quadragesimales" of Robertus Caracciolus, Venice, 1479, contains an elaborate discussion of circumcision and a long sermon on pestilence in which the author is less concerned with the disease itself than with the sins for which he regards it as a chastisement. The sermon on women is curious, to say the least, and he gravely discusses whether women were produced with the other animals or made from man or made directly by the Divine Creator.

Other interesting works in the lot are the "Mariale," of Albertus Magnus (Basel, 1475), in which the miraculous conception of the Virgin is discussed in nine chapters and really has to do with generation, and the "Homiliae" of Gregory the Great, Venice, 1493, containing the famous homily against the astrologers. The collection of tracts of Petrus de Abano, Arnoldus de Villa Nova and Valascus de Taranta, on poisons and the pest, Padua, 1487, is an important medical work.

Strabo, "Geographia," Venice, 1494; Dionysius Periegetes, "Cosmographia," Venice, 1498; and Petrus de Cruce, "Questio de ratione subjecti primi scientiae," Venice, 1500, are important scientific books.

The "Cato moralisatus" with the commentary of Phillipus de Pergamo, commonly known as the "Speculum regiminis," Lyon, 1497 and 1498, is a rare edition and contains much of medical interest. The commentator lived at Padua where there was a great medical school and he had much to say about medicine, and more about doctors, much of it is uncomplimentary.

Two classical texts are the "Facta et dicta memorabilia" of Valerius Maximus, Venice, 1474; and the commentary of Dionysius de Burgo, on the same work, printed by the R printer of Strassburg about 1471. The last is very interesting from a typographical point of view. Dionysius devotes considerable space to a legend of Aesculapius and twenty-eight pages to dreams. He also discusses at length the question of death, both real and apparent.

REPORT OF THE MEDICAL SERVICE BOARD OF THE AMERICAN COLLEGE OF SURGEONS, JUNE 10, 1934

The Medical Service Board of the American College of Surgeons respectfully submits the following report to the Board of Regents:

1. The American College of Surgeons affirms its interest and its desire to coöperate with other agencies looking toward the provision of more adequate medical service to the whole community.

2. The College believes that it is the duty of the medical profession to assume leadership in this movement and to take control of all measures directed to this end.

3. Encouragement should be given to the trial of new methods of practice designed to meet these needs, and a careful evaluation of their success should be the duty of the medical profession before they are offered for general adoption. All such new and experimental methods of practice must be conducted strictly in accordance with the accepted code of ethics of the medical profession in order that the interests of the patient and of the community may be protected.

4. The College recognizes for immediate study four groups of the population for whom more adequate medical service should be made available, as follows:

a. The indigent.
b. The uneducated and credulous members of the community.
c. Those who because of limited resources are unable, unaided, to meet the costs of serious illness and hospitalization.
d. Those living in remote districts where adequate medical service is not obtainable.

5. The care of the indigent sick should be a direct obligation upon the community and (unless otherwise compensated by intangible benefits such as staff and teaching appointments, opportunity and experience) physicians fulfilling this public service should receive remuneration.

6. The College should work in coöperation with other medical groups in order to dispel the ignorance and credulity of the public, and to bring the people to a proper realization of the protective and curative resources of modern medicine.

7. The American College of Surgeons recognizes that the periodic pre-payment plan providing for the costs of medical care of illness and injury of individuals and of families of moderate means offers a reasonable expectation of providing them with more effective methods of securing adequate medical service.

A number of different plans for the organization of such services have been proposed, although few have been in operation long enough to permit definite conclusions in regard to their success. It is to be desired that these experiments be continued. Conditions differ to such a degree in different parts of the country that a specific plan which is practicable in one place may require modification of details in other communities. The varying restrictions imposed by present insurance laws in different states further complicate the problem.

Periodic pre-payment plans providing for the costs of medical service may be divided into two classes:

A. Payment for medical service.
B. Payment for hospitalization.

It is suggested that plans for the payment of hospitalization alone (Class B) without provision for payment for medical service, may be considered the first project to be undertaken in the average community.

The American College of Surgeons believes that certain general principles can and should be established, the observance of which will tend to obviate known difficulties and dangers which may threaten the success of these special forms of medical service. These principles are as follows:

a. Periodic pre-payment plans for medical service should be free from the intervention of commercial intermediary organizations operating for profit. After deduction of the clerical costs of operation of the fund and such accumulation of reserve as may be advisable in the interest of the contributors or may be legally imposed, the full amount paid by the contributors should be available for medical and hospital services.
b. In the interest of the patient, the organization of plans for the periodic payment of medical and hospital costs must be under the control of the medical profession. The medical profession must act in concert with the hospitals and such other allied services as may be involved in the individual project, together with a group of citizens representative of the whole community and of industry who are interested in the successful operation of the plan.
c. The principle of free choice of the physician and hospital by the patient must be assured to the end that the responsibility of the individual physician to the individual patient shall always be maintained. When hospitalization is required, this choice must of necessity be limited to the physicians and surgeons who hold appointments on the staffs of the hospitals participating in the plan or to those physicians and surgeons who are acceptable to the hospital. It is further recommended that only approved hospitals be admitted to participation in such a plan.
d. The compensation of the physician and of the hospital should be estimated with due regard to the resources available in the periodic payment fund and should be based upon the specific services rendered.
e. The organization and operation of any plan of this type must be free from any features not in accordance with the code of ethics of the medical profession which code has been established for the protection of the patient.
f. The medical organizations participating in such a plan must assume the responsibility for the quality of service rendered.

8. Periodic pre-payment plans for medical and hospital service should eliminate many of the conditions which have brought about the development of industrial contract practice. Until such plans have been more widely established certain general principles are here formulated with a view to the elimination of the commercial features of such forms of medical service.

a. The Minimum Standard for Industrial Medicine and Traumatic Surgery of the American College of Surgeons should be accepted. This standard is as follows:

MINIMUM STANDARD FOR INDUSTRIAL MEDICINE AND TRAUMATIC SURGERY

1. That the industry shall have an organized medical department, or service, with competent medical staff including consultants and adequate emergency dispensary and hospital facilities and personnel to assure efficient care of the ill and injured.

2. That membership on the medical staff shall be restricted to physicians and surgeons who are (a) graduates of scientific medicine holding the degree of Doctor of Medicine, in good standing and licensed to practice in their respective states or provinces; (b) competent in the field of industrial medicine and traumatic surgery; (c) worthy in character and in matters of professional ethics, that in the latter connection, the practice of the division of fees under any guise whatsoever be prohibited.

3. That there shall be a system of accurate and complete records filed in an accessible manner—a complete record being one which includes identification data; cause of illness or injury; nature and extent of illness or injury; detailed description of physical findings; special examinations such as consultations, clinical laboratory and x-ray; tentative or provisional diagnosis; treatment; prognosis with estimated period of disability; progress of illness or injury; final diagnosis; condition on discharge; end results; and such additional information as may be required by statute for Workmen's Compensation claims or for other purposes.

4. That all patients requiring hospitalization shall be sent to institutions approved by the American College of Surgeons.

5. That the medical department shall have general supervision over the sanitation of the plant and the health of all employees.

b. Physicians and surgeons, qualified as in paragraph 2 of the above minimum standard may properly be employed on a full-time or a part-time basis by industrial organizations to provide medical and surgical service for their employees, as follows:

i. To provide emergency service and first aid in injury or disease, and to provide adequate medical or surgical care for industrial injuries and diseases. Medical and surgical care of the families of employees, and of employees themselves, except for emergency and industrial injuries and diseases, should be provided by the industrial physician only in remote districts where other adequate medical service is not available.

ii. To provide pre-employment and periodic physical examinations.

iii. To study the hazards of the particular industry and to coöperate with other agencies in effecting such measures as may be needed for the prevention of injury and disease.

iv. To keep accurate records such as may be required by local Workmen's Compensation laws, and so complete as to serve for scientific investigation of industrial hazards with a view to their further prevention. These records are privileged communications, subject always to due process of law.

c. The sale of a contract by an industrial organization to an individual physician or group of physicians for medical and/or hospital service for its employees encourages commercial competition and is to be condemned.

d. Unethical practices in publicity, advertising, solicitation, and competition, either of a professional or of a financial nature, must be eliminated.

e. The accepted code of ethics of the medical profession, which is designed to protect the best interests of the patient, should apply to industrial medical service as to all other forms of medical practice.

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THE CONDITIONS AT THE BROOKLINE TUBERCULOSIS HOSPITAL

About May 1 a patient at the Brookline Tuberculosis Hospital sent a letter to the Board of Health complaining of the food at the Hospital. The complaint was referred to Dr. Francis P. Denny, the Health Officer and Medical Director of the Hospital for investigation. Dr. Denny reported that as a result of his investigation he was satisfied that the food was good. A second letter from the same patient was received on May 21, and on adjournment four members visited the Hospital without warning to the staff just at the time of the evening meal. Opportunity was given to all the patients to say what they thought of the food. After their visit the members of the Board expressed their satisfaction with the conditions which they found at the Hospital.

The day following, the patient who had made the complaint left the Hospital and stated to the press that he would not return until the cook at the Hospital had been discharged. He drew up a petition to the Board which was signed by eleven other patients, requesting that the cook be discharged.

At its meeting on June 4, after a conference with the Superintendent, Miss Elizabeth McMahon, and Dr. Denny, the Board voted unanimously to take no action on the petition.

AN HONOR TO DR. HARVEY CUSHING

Among the honorary degrees awarded by Syracuse University, Dr. Harvey Cushing of Yale University Medical School was the recipient of the degree of LL.D.

MORTALITY RATES

Telegraphic returns from 86 cities, with a total population of thirty-seven millions for the week ending June 2, indicate a mortality rate of 11.2 as against a rate of 10.0 for the corresponding week of last year. The highest rate (24.8) appears for Schenectady, N. Y., and the lowest (5.9) for South Bend, Ind. The highest infant mortality rate (26.1) appears for San Antonio, Texas, and the lowest for Bridgeport, Conn., Duluth, Minn., Evansville, Ind., Louisville, Ky., South Bend, Ind., Syracuse, N. Y., and Tampa, Fla., which reported no infant mortality.

The annual rate for 86 cities is 12.3 for the twenty-two weeks of 1934, as against a rate of 11.7 for the corresponding period of the previous year.

SUMMARY OF DEATHS AND DEATH RATES (ANNUAL BASIS) FROM AUTOMOBILE ACCIDENTS PER 100,000 ESTIMATED POPULATION FOR 86 CITIES FOR CORRESPONDING PERIODS OF 1934 AND 1933

	Week ending June 2, 1934	Week ending June 3, 1933	First 22 weeks 1934	First 22 weeks 1933
Total deaths	178	133	3,464	3,027
Death rate	24.8	18.5	21.9	19.2
Deaths due to accidents in city	135	104	2,802	2,427
Death rate	18.8	14.5	17.7	15.4

—*Bureau of the Census.*

EXTRACTS FROM THE JUNE BULLETIN OF THE NATIONAL TUBERCULOSIS ASSOCIATION

DR. DUNHAM, *President*

Dr. Kennon Dunham of Cincinnati, whose work for many years in the field of x-ray diagnosis of tuberculosis has been outstanding, and who has contributed much to the whole movement, was elected president of the Association.

TRUDEAU MEDAL

The Trudeau medal was awarded to Dr. William Snow Miller of Madison, Wisconsin. In announcing the award Dr. Esmond R. Long, chairman of the committee, spoke of Dr. Miller's lifelong and outstanding research in the anatomy of the lung and chest.

TIMELY WARNINGS

Past experience has shown that the incidence of poliomyelitis is likely to begin in June and progress through the summer months.

The Fourth of July brings a crop of casualties which are largely preventable, and the mortality from drowning is now well underway.

The family physician may well warn parents of the dangers incident to warm weather and the vacation periods.

Although typhoid is a declining menace, there will be sporadic cases and there is always a danger from a carrier. The doctor may tell his families about those dangers, and give timely advice, especially urging early medical service in every case of illness.

CORRESPONDENCE

DISCUSSION OF AFFAIRS AT THE BOSTON CITY HOSPITAL

June 11, 1934.

Editor of the Journal,

Dear Sir,

The editorial in this issue of the *Journal*, relative to the Boston City Hospital, seems in conflict with the "Accepted Resolutions" of the Norfolk District Medical Society, and the Council, which by a unanimous vote accepted and approved said Resolutions.

The Finance Commission of Boston has done a notable work in bringing before the public the injustice that has been perpetrated, on the medical profession of Boston, by the Boston City Hospital.

The Committee from the Norfolk District was well aware of the unfair competition in the O. P. Dept. The Committee saw numbers of well-to-do people attend the Clinics, come in expensive cars, walk in and not pay a cent, and no questions asked, all at the expense of the taxpayers.

The irony of the affair is, that most of the doctors are taxpayers: they are supplying the wherewithal to destroy their own means of making a livelihood, and the doctors ministering to these well-to-do patients are destroying their own business as well as that of their fellows.

What an injustice it is to the taxpayers of Boston to have to support, in the hospital proper, patients who are perfectly able to pay: politicians and their friends; clients of insurance companies, who pay little or nothing for treatment and board.

When we consider the fact that the Boston City Hospital, in conjunction with some other hospitals in Boston, has about ruined the profession by unfair practices, and that much of the unfair competition has been done, outside the Charter of the City Hospital, that is illegally, it seems that the *Journal* should condemn such practices, instead of suggesting a legal means of continuing the present unjust course, as regards both the physician and the taxpayer.

CHARLES MALONE, M.D.

46 St. John Street,
Jamaica Plain, Mass.

SHALL WE WAIT FOR THE PUBLIC TO ACT?

Massachusetts General Hospital, Boston.

Editor, *New England Journal of Medicine,*

I am enclosing an editorial which I gleaned from Wednesday's *Cleveland Press.* It seems to me to be a thoroughly just and intelligent criticism of the official American Medical Association attitude. This attitude certainly bears a very striking resemblance to old guard Republicanism. It is a form of unenlightened standpatism, thoroughly out of tune with the times. It is the kind of attitude that quite naturally leads the public to brand the American Medical Association the "Doctors' Trust." Both the profession and the public are to be congratulated that in the *New England Journal* we have openmindedness and constructive leadership. Would that we might say the same of the national organ.

Sincerely yours,

J. H. MEANS, M.D.

June 15, 1934.

EDITORIAL

CONSERVATIVE DOCTORS

If the resolutions of the American Medical Association read somewhat like the resolutions of an old-guard Republican campaign committee, it is for like reasons.

They wish the depression hadn't happened, and they can hardly believe that it did. And they like to believe that, if we just sit tight and let nature takes its course, nothing like it will ever happen again. They hope that the free play of economic forces will again make everybody prosperous—prosperous enough to pay their doctors' bills, anyhow—and permanently prosperous, next time.

One can sympathize with the fear physicians feel toward any scheme in which government officials, politicians, insurance company executives or somebody would be bossing the doctors.

But how prevent the spread of public clinics, hospitals and insurance plans as long as millions of people cannot pay for medical care?

The doctors will not go so far as to say that all our public hospitals and public clinics now in existence ought to be abandoned. But they are reluctant to see them multiplied.

Perhaps it all comes down to one's view of the probabilities about the future volume of unemployment in America. For the time being, the doctors who can afford to attend conventions prefer to believe that everybody is soon going to be prosperous again. They do not wish to see a permanent expansion of public institutions based on a temporary emergency.

If, on the other hand, the economic status of a very large fraction of the population is going to continue uncertain, government will inevitably be drawn deeper into the effort to make that first essential—medical care in time of sickness—more certain through collective action.

To us it would seem wiser for the medical profession, instead of trying to preserve a status that has not actually existed for years, to take the lead in formulating a plan whereby the burden of costs could be reduced or distributed without impairing the profession's control of its own activities.

If the doctors wait until some one else forces a scheme upon them, it may be less to their liking and less satisfactory in its results.—*Cleveland Press.*

PUBLICITY OF MEDICAL MATTERS

St. Elizabeth's Hospital
736 Cambridge Street
Brighton, Mass.

May 29, 1934.

Editor, *New England Journal of Medicine,*

My attention was directed by the Committee on Ethics and Discipline, of the Massachusetts Medical Society, to an article published in the *Boston Herald,* February 16, 1934, wherein my name appeared quite prominently in a medical "write-up".

This article was written by a young lady who three months previously presented herself at the Clinic and sought permission to remain as an observer. She said she had visited and observed in several hospitals, being interested especially in reconstruction work.

I granted her permission to remain after I had first explained our standard of ethics as it pertains to publicity, and had warned her that I was not to be quoted or my name used, under any condition, in the public press. Further than this I had no knowledge or connection in any way with the publication of this article.

I am glad to support the Committee on Ethics and Discipline in its efforts to curb publicity and wish to state that I regret most sincerely this undesired publicity, and that I am opposed to all forms of medical "write-ups".

Yours truly,

THOMAS J. BRODERICK, M.D.,
Orthopedic Department.

A PROTEST AGAINST THE "FREE ABSTRACT JOURNALS" PUBLICATIONS

Clinical Medicine and Surgery

June 6, 1934.

The Editor,
New England Journal of Medicine,

The time appears to have arrived when, if we do not want to see our living carried off before our eyes, by commercial exploiters of the legitimate medical press, we must make a concerted effort to stop it.

The so-called "Free Abstract Journals" (whose names are familiar to you) could not exist if they were unable to act as parasites upon the sound and scientific medical periodicals, whose editors and publishers spend the time, brains and money to se-

lect, arrange and present the material which these people appropriate for their purposes.

If these purveyors of predigested professional pabulum carry their plans to fruition—if we *permit* them to do it—we, who are depending for our livelihood upon furnishing the medical profession with information, will find many of our subscribers and most of our advertisers leaving us for the pages of these sheets which could not live for one moment except upon us.

I have forbidden the publishers of the periodicals to which I allude to reprint or abstract any original communications appearing in the pages of *Clinical Medicine and Surgery*, and am copyrighting each issue of our journal, beginning with the June, 1934, number. This will not affect you nor any other journal publishing original articles or having a paid subscription list. You may abstract from our pages as freely as you please. If the editors and publishers of most of the responsible and reputable medical journals in the country would do the same, we would have the situation well in hand.

What are your reactions to this suggestion?

May I count upon your support in this matter?

In what way or ways can I coöperate with you to make our positions in the medico-literary field secure from pirates?

Sincerely and fraternally yours,

GEORGE B. LAKE, M.D.,
Editor and Publisher.

P.S. My strictures do not apply to *Medical Economics*, which is a properly edited journal, publishing original material in its special field and not competing with us, except in the legitimate manner of an honorable contemporary.

REPORTS AND NOTICES OF MEETINGS

THE HARVARD MEDICAL SOCIETY

The Harvard Medical Society met in the amphitheatre of the Peter Bent Brigham Hospital on Tuesday, May 8, at 8:15 P.M. Dr. Walter B. Cannon presided. Following the presentation of clinical cases, some aspects of the peripheral vascular circulation were discussed by Drs. James C. White and Norman E. Freeman from the Surgical Service of the Massachusetts General Hospital.

The first clinical case was that of a boy who had been shown at a previous meeting. He had always been less active than his playmates and evidenced splenomegaly at the age of five. He experienced no real illness until March 20 of this year when a cough and intermittent fever developed. This was followed by severe repeated hematemeses at the second of which he entered the Peter Bent Brigham Hospital on the Medical Service. The spleen was palpable below the umbilicus. The red blood cell count was one and a half millions with a hemoglobin of 32 per cent. The white blood cell count was 6000. He was treated for hemorrhage and subsequent anemia with iron and intramuscular liver extract. At the time of the meeting the red blood cell count had become essentially normal and the white blood cell count was 2500 with no abnormal cells present. The case was transferred to the surgical service for splenectomy.

The x-ray studies in this case are of especial interest. At entry the chest plates showed a picture of bronchopneumonia which may have been due to aspirated blood. A month later plates showed normal lung fields, thereby eliminating tuberculosis. After ingestion of a thick barium mixture, the negative shadow of a rounded long object was demonstrated in the esophagus resembling a foreign body, which is the first case of varicose vein of the esophagus demonstrated by x-ray at this hospital. Dr. Sosman stressed the point that the film should be exposed from thirty to sixty seconds after administration of the thick barium so that the esophagus is merely coated with the radio-opaque substance.

The second case was that of a forty-five year old Italian housewife who first entered the hospital in November, 1932, with a history of swelling behind the left knee of three months' duration. Sharp stabbing non-radiating pain had occurred in the same region five years previously. Treatment for neuritis had been instituted by a local doctor. A nodular mass the size of a lemon lay medially behind the left knee. There was reddening of the overlying skin. The chest plates were reported negative. A cystic mass was removed at operation which upon histological examination proved to be an hemangioendothelioma. Following the operation a course of x-ray treatments was given.

In December, 1933, the patient returned to the hospital with a mass in the incisional scar, which later was observed to be fluctuating in size and tenderness. The patient was readmitted to the hospital shortly before the meeting. On examination, the mass in the site of the old scar was found freely movable above but fixed below. No lesions were observed in the groin, but x-ray examination revealed soft tissue shadows in the lateral portion of the right lung and the left apex which Dr. Sosman believes represent definite pulmonary metastases. Dr. Homans recalled a previous case in a boy and made the observation that tumors of this nature go on harmlessly for a long time only to become malignant after surgical intervention.

The first speaker of the evening was Dr. James C. White, who discussed "Studies on the Innervation of the Vessels and Their Application to Neurovascular Surgery." In reviewing the results in cases of Raynaud's disease in the Circulatory Clinic at the Massachusetts General Hospital, Dr. White pointed out that surgery has been most successful in relieving symptoms in the lower extremities by excision of the second to fourth lumbar sympathetic ganglia. Failure to relieve symptoms in the upper

extremities in the first fifteen cases was due to incomplete sympathetic denervation followed by regeneration of the nerve fibers and return of symptoms after six to eight months. The possibility of regeneration was removed in the later operations for the condition by excision of the inferior cervical and the first two thoracic ganglia. After a short period of vasodilatation even these patients showed a skin temperature in the hands of 78° F. (room temperature 70° F.), while that of the feet after sympathetic denervation was 90° F. in the same environmental temperature.

Dr. White explained this phenomenon by T. R. Elliott's work done in England in 1905 and recently reëmphasized by Dr. Cannon. This has brought out the surprising fact that smooth muscle becomes sensitized to the action of adrenin after severance and degeneration of its postganglionic sympathetic neurones. The possibility that the denervated smooth muscle in the digital arterioles can be constricted by circulating hormones was first investigated by Smithwick, Freeman, and White in patients after unilateral sympathetic denervation of the upper extremities for Raynaud's disease. Injections of adrenalin (1 to 200,000) produced a striking fall in the skin temperature of the previously denervated hand, but no detectable fall in the limb with intact autonomic nerve supply. To test whether the patient secreted enough adrenin from his own glands to have any effect on the denervated sensitized blood vessels, insulin was injected to produce a hypoglycemia which stimulates the sympathico-adrenal system. The same effect was observed as after the injection of adrenalin. More recently these observations have been repeated on rabbits in which one ear had been totally denervated. After a preliminary paralysis, the denervated ear became hypersensitive to agents calling into play the sympathico-adrenal system. In addition, the speaker reported that the phenomena of sensitization disappear almost entirely after extirpation of the adrenals. What remains of the effect may be due to the intrinsic tone of the blood vessels themselves and possibly to the action of sympathin.

Dr. White further declared that studies similar to those mentioned above have revealed the fact that no sensitization of the lower extremities occurs comparable to that shown to exist in the upper extremities after sympathetic denervation. This he explained from an anatomical point of view. In the operation at present employed for sympathetic denervation of the upper extremities by the excision of the inferior cervical ganglion and the first two thoracic ganglia, the surgeon removes cell bodies for the entire postganglionic nerve supply to the upper extremities except for a few fibers entering the brachial plexus through the fifth cervical nerve. Hence practically the entire vascular supply of the hand is sensitized to the action of adrenin after time has been allowed for degeneration of the nerve fibers. In the lower extremity, however, removal of the second to fourth lumbar ganglia destroys only the preganglionic fibers supplying the leg via the anterior femoral and obturator nerves. The cell bodies for the postganglionic fibers in the sciatic nerve, which is the important supply to the foot, are located in the fourth lumbar to third sacral ganglia. Thus lumbar ganglionectomy essentially interrupts only the preganglionic innervation of the lower leg.

Dr. White concluded his address with the suggestion that section of the preganglionic fibers to the upper extremity might be obtained by cutting the upper anterior thoracic roots. This should lead to paralysis of only a part of the intercostal muscles. He is at present planning to investigate this procedure in the rabbit*.

Dr. Norman E. Freeman, the second speaker, spoke on "Factors Controlling the Peripheral Blood Flow in Man." A modification of the method of Hewlett and Van Zwaluwenburg was used to determine the blood flow in the hand. The apparatus is built on the plethysmograph principle, the cylinders being modified calorimeters in which the temperature can be kept constant within very narrow limits. In measuring the blood flow in human hands, the venous return from the hand is obstructed at the wrist by a modified blood pressure cuff by which the pressure is kept just below diastolic. The hands are inserted into the calorimeter and the change in hand volume per unit of time recorded on a smoked drum through a closed lever system. While records are being taken, emotional disturbances, noise, pain, and worry must be eliminated, because they reduce the peripheral flow very significantly. The patient must also be in basal condition with respect to digestion and exercise.

By means of lantern slides, Dr. Freeman showed the various well-known vasomotor reflexes mediated through the sympathetic nervous system, such as a diminished blood flow when too rapid a loss of heat was threatened and an increased blood flow on heating the body whether by the application of external heat or by increasing the internal metabolism through dinitrophenol.

In Raynaud's disease, Dr. Freeman showed an increase in blood flow in the affected hand after novocaine block of the sympathetic nerves even though the temperature of the hand was maintained at a low level. The blood flow in the completely sympathectomized hand immediately after operation is at a high level, and is influenced very little by local changes in temperature. Some time later, however, the blood flow varies directly with the local temperature. It was shown that the rate of blood flow was a function of temperature according to laws of chemical reactions.

Dr. Freeman also made the interesting observation that by exercising the hand for two minutes or

*Since the meeting it has been found that after section of the preganglionic neurones in the upper thoracic anterior spinal roots, the vessels in rabbit's ear remain in a constant state of vasodilatation. After this operation, the arteries are no longer affected by hormones circulating in the blood stream.

by occluding its blood supply for ten minutes, a blood flow debt was incurred by the tissues which was subsequently paid by a proportionately increased blood flow in the hand. From previous work on the effect of decreased oxygen concentrations on the tone of arteries, it seems that increased blood flow is probably due to an oxygen debt rather than to the accumulation of metabolites locally.

Dr. Freeman was able to make a quantitative analysis of the blood flow in a sympathectomized hand at different temperatures. If at a certain temperature of the hand a tourniquet was applied for five minutes and again for ten minutes, following the release of the tourniquet, the excess blood flow above the basal flow after the ten-minute occlusion was double that following the five-minute occlusion. Again, if the basal flow at three different temperatures was determined and a blood flow debt of ten minutes created by occlusion of the circulation at each temperature, the excess blood flow at each temperature was equal, within the experimental limits, to the size of the debt.

In conclusion, the speaker pointed out that the function of the peripheral blood flow from the point of view of general bodily economy is to regulate the temperature of the body. It is estimated that 85 per cent of the body heat is dissipated by the extremities reflexly. After sympathetic denervation, however, the peripheral blood flow is apparently determined by the actual needs of the local tissues. With these facts in mind, it becomes illogical to apply local heat in cases of peripheral vascular disease such as diabetic arteriosclerosis and thromboangiitis obliterans in which the vascular supply to the extremities is incompetent, because heat would merely increase the demand for a greater rate of blood flow. It is often observed clinically that such patients complain of pain when heat is applied to the extremities.

Following a discussion by Drs. Drinker, Homans, and Cutler, the meeting was adjourned.

PLYMOUTH DISTRICT MEDICAL SOCIETY

A stated meeting of the Plymouth District Medical Society was held at the Brockton Hospital, May 17, 1934. The meeting was called to order by the President, Dr. Alley, at 11:15 A.M. The minutes of the last meeting were read and approved.

The President then turned the meeting over to Dr. Barrett who had charge of the literary program prepared by the Staff of the Hospital. A series of short clinical papers was presented by members of the Brockton Hospital Staff.

Dr. Loring Packard demonstrated a series of x-ray films, showing the normal anatomy of the heart and lungs and a number of unusual pathological conditions.

Dr. J. R. Noyes showed a patient who entered with such a severe fracture of all bones of the face that the hard palate was mobile. This had been immobilized with traction from a metal and plaster head band to a bar in the mouth with an excellent cosmetic result and good dental approximation.

Dr. W. S. Walker presented a patient forty-two years of age with severe cretinism, anemia, and abnormal uterine bleeding. He discussed the not uncommon association of hypothyroidism and abnormal uterine bleeding and also pointed out the danger of giving morphine to patients with myxedema or cretinism.

Dr. George A. Buckley discussed several fracture cases, pointing out among other things that persistent pain may well be an indication of poor reduction. One patient was first seen several years ago with a fracture of both bones of one leg. He was treated in the usual conservative manner; the result was excellent but his convalescence very long. He came back six months ago with a similar fracture of the other leg and this time he was given early baking and massage, thereby halving his period of disability.

Drs. C. D. McCann and B. Bornstein discussed the management of functional menorrhagia with endocrine products, pointing out the relationship of Prolan A and Prolan B to follicle ripening and corpus luteum development respectively and their relationship to the changes in the uterine mucosa during the menstrual cycle.

Dr. F. F. Weiner demonstrated pyelograms of an unusual case of bilateral complete duplication of the ureters in a patient with a large dermoid cyst.

He also outlined the management of syphilis in the Brockton Hospital Clinic stressing (1) the importance of early diagnosis during the primary and secondary stages by darkfield examination, (2) the need of approximately two years of continuous treatment in early syphilis, (3) the necessity of routine lumbar puncture, and (4) continuance of treatment for an adequate length of time even in face of a negative serology.

FAULKNER HOSPITAL CLINICAL MEETING

The regular monthly clinical meeting of the Staff of the Faulkner Hospital was held at the hospital on Thursday, June 7, at 5:00 P.M.

Two of the cases which had come to autopsy during the month were presented for discussion.

One was a case of cardiac decompensation with a history of having had what might have been a coronary occlusion some years before. There had also been hypertension and a period of cardiac decompensation in the past. There was a positive Wassermann. There were murmurs suggesting involvement of the aortic valve and auricular fibrillation was also present. The point of clinical interest was what type of lesion would be found in the heart. The signs of involvement of the aortic valve with a positive Wassermann reaction in the blood made it seem likely that a heart worn out by working with the handicap of injury to the aortic valve due to syphilis would be found. On the other hand auricular fibrillation in such conditions is unlikely, and

also a heart which has once decompensated with such a lesion usually does not recover. In addition to the disturbance in the heart there had just before death developed a hemiplegia presumably due to an embolus from a mural thrombus and there was evidence of chronic nephritis of the vascular type. The autopsy showed that vascular disease of the arteriosclerotic type rather than syphilis had been the main factor in causing the cardiac decompensation. There was a mural thrombus in the left ventricle.

The other case was one in which evidence of pyloric obstruction existed with a history of hematemesis on two occasions during the ten months preceding death. The x-ray studies showed some type of lesion in the duodenum which was thought to be the scarring of an old ulcer. There was a dilated stomach and some spasm of the pylorus but not complete obstruction at the pylorus. The patient was losing weight and was somewhat anemic. The other physical finding of interest was a hard mass completely surrounding the rectum at its lowest point. This patient had been under observation earlier in the year and at that time this hard mass did not surround the bowel and seemed to be attached to one corner of the prostate. There was no retention of urine. On proctoscopic examination there was no evidence of ulceration of the mucous membrane of the bowel and an attempt to obtain a biopsy did not help because only normal mucous membrane was removed. Because the pyloric obstruction could not be established as due to malignant disease, exploration was advised and carried out. The patient did not survive the operation more than a few hours and the operation and partial postmortem examination showed a diffuse neoplasm presumably a lymphoblastoma involving the duodenum, other parts of the gastro-intestinal tract and invading the perirectal tissues. Had the patient survived it is possible that x-ray therapy might have been beneficial temporarily.

Dr. Edward L. Young, Jr., then talked about difficulties in the diagnosis of disease of the gallbladder and called attention to some of the peculiarities in the localization of the symptoms and emphasized in just what manner the x-ray studies and the Graham test should be used in reaching conclusions. He also called attention to the importance of seeing the patient during the attack in certain diseases of the gallbladder. He mentioned two cases in which the pain and discomfort were localized under the left costal border instead of the right. He cited cases in which the gallbladder according to the Graham test functioned normally but still at operation showed pronounced chronic inflammation in the wall, and emphasized the fact that this test, after all, only shows the function of the gallbladder so far as receiving bile and discharging it again, and does not necessarily demonstrate disease of the gallbladder. He also called attention to the fact that there seems to be definite evidence that bile containing the dye and throwing a shadow may accumulate in the duodenum giving an appearance suggesting a gallbladder and, after a fat meal, may disappear from the duodenum giving the impression that there is a gallbladder functioning properly.

This meeting completes the series of meetings for the winter season of 1933-1934. The attendance and interest in these meetings have been such that the Staff feels that another series of meetings should be scheduled for the coming winter. Therefore, a schedule of the Faulkner Hospital Clinical Meetings for the winter season of 1934-1935 will be announced in September.

MEDICAL LIBRARY ASSOCIATION

The thirty-sixth annual meeting of the Medical Library Association was held in Baltimore, Md., May 21 to 24, inclusive, under the presidency of Miss Marcia C. Noyes, Librarian of the Medical and Chirurgical Faculty of the State of Maryland.

The next annual meeting will be held in Rochester, N. Y., in June, 1935.

The following officers were elected for 1934-35:

President: Mr. Charles Frankenberger, Librarian, Medical Society of the County of Kings and Academy of Medicine of Brooklyn, Brooklyn, N. Y.

Vice-President: Miss Louise Ophuls, Librarian, Lane Medical Library, San Francisco, Cal.

Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

Treasurer: Miss Mary Louise Marshall, Librarian, Tulane University Medical School, New Orleans, La.

Chairman, Executive Committee: Miss Marjorie J. Darrach, Librarian, Medical Science Department Detroit Public Library, Detroit, Mich.

Editor of the "Bulletin": Mr. J. C. Harding, Librarian, Cleveland Medical Library Association, Cleveland, Ohio.

Manager of Exchange: Miss Ella B. Lawrence, Librarian, Washington University School of Medicine, St. Louis, Mo.

INTERNATIONAL ASSOCIATION FOR PREVENTIVE PEDIATRICS

The Fourth Conference of the International Association of Preventive Pediatrics (medical section of the Save the Children International Union) will this year be held at Lyons, Thursday, and Friday, September 27-28.

The subjects to be discussed and the names of the rapporteurs are as follows:

(1) The Prophylaxy of Malaria in Children: Prof. Cacaco, Naples; and Prof. Gillot, Algiers, with whom will be associated Dr. Larrouy (a British rapporteur will be named later).

(2) The Prophylaxy of Rickets and Convulsions: Prof. Adam, Dantzig; and Prof. Monrad, Copenhagen.

Those who desire to be present at the Conference, as well as take part in the discussions following

the reports, are requested to communicate with the Secretary of the I. A. P. P., 15 rue Lévrier, Geneva (Switzerland).

THE AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians will hold its Nineteenth Annual Clinical Session in Philadelphia, April 29-May 3, 1935.

Announcement of these dates is made particularly with a view not only of apprising physicians generally of the meeting, but also to prevent conflicting dates with other societies that are now arranging their 1935 meetings.

Jonathan C. Meakins, of Montreal, Que., is President of the American College of Physicians, and will arrange the Program of General Sessions. Dr. Alfred Stengel, Vice-President in Charge of Medical Affairs of the University of Pennsylvania, has been appointed General Chairman of local arrangements, and will be in charge of the Program of Clinics. Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa., is in charge of general and business arrangements, and may be addressed concerning any feature of the forthcoming Session.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

July 24-31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schniz. General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich.

August 18 - September 30—Medical Study Trip to Hungary. See page 975, issue of May 10.

September 3-6—American Public Health Association, at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis. For information address the National Tuberculosis Association, 450 Seventh Avenue, New York City.

September 10, 11, 12, and 13—American Congress on Physical Therapy will meet in Philadelphia at the Bellevue Stratford. For details write American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

September 10-15—First International Congress of Electro-Radio-Biology will be held in the Doges Palace at Venice. For details address the General Secretary of the Congress, Dr. Giocondo Protti, S. Gregorio 173, Venice (Italy).

September 27 and 28—International Association for Preventive Pediatrics. See page 1353.

September 28-29—New England Surgical Society will meet at Burlington, Vermont. For details address the Secretary, Dr. John M. Birnie, 14 Chestnut Street, Springfield, Mass.

October 22 - November 2—1934 Graduate Fortnight of the New York Academy of Medicine. See page 1240, issue of June 7.

October 31 - November 2—Massachusetts State Nurses' Association, Hotel Statler, Boston. For information write Miss Helene G. Lee, R.N., 420 Boylston Street, Boston.

April 29 - May 3, 1935—The American College of Physicians. See notice above.

June, 1935—Medical Library Association. See page 1353.

BOOK REVIEWS

Human Embryology and Morphology. By Sir Arthur Keith. Fifth Edition. 558 pp. Baltimore: William Wood and Company. $10.00.

The fifth edition of this book, the first of which appeared thirty-two years ago, takes cognizance not only of the orthodox systematic and descriptive embryology, but also takes into consideration many of the newer advances made by the application of experimental methods to embryology. While adequate for the purposes of the student and the practitioner in description of embryological processes and of anatomic detail, nevertheless the book avoids an unwieldy size. A note from the author's preface might well register with more of our scientific writers. It says: "There is one danger to which successful textbooks are particularly exposed in these times. It is the danger of overgrowth. Dominant stocks of animals have been hurried to extinction in past geological ages because their bodies became so big as to be unwieldy. I have seen most valuable and prosperous textbooks killed by overgrowth."

This clearly written volume is adequately illustrated by a number of well-chosen diagrams. In the discussion of the development of various parts of the body, adequate attention is placed on points of clinical significance, such as malformation. This book may well be considered a distinct addition to any physician's library.

Text-Book of Pathology. By Robert Muir. Third Edition. 957 pp. Baltimore: William Wood and Company. $10.00.

This textbook is one of the standard English works on pathology and has many commendable features. However, it finds stiff competition from the best of the American textbooks and particularly is at a disadvantage as compared with the excellent text of Boyd of Winnipeg. The small, yet adequate, size of the illustrations is a feature that should do much to reduce the cost of the book and might well be followed by some of our own writers.

Adequate emphasis is laid on gross pathology without neglecting histologic detail.

With the treatment of some subjects the reviewer is not in sympathy, as for example, arteriosclerosis. Here Muir sharply divides the atheromatous type from other types of arteriosclerosis, excluding it from the classification of arteriosclerosis. The statement that calcification of the media is a frequent occurrence in the abdominal aorta is certainly not in keeping with experience here. The division of arteriosclerosis into that secondary to nephritis and primary arteriosclerosis is unusual.

The discussion of Paget's disease of bone and osteitis fibrosa cystica is rather disappointing. The section on bone tumors is also a bit inadequate.

The style is very pleasant, clear and readable, and no doubt contributes to the intrinsic worth that has led this textbook to its third edition.

The index leaves much to be desired. Thus, the only mention of carbon monoxide in the index leads one to the statement that "Lorrain Smith found by means of the carbon monoxide method that the blood volume in cases of chlorosis was greatly increased."